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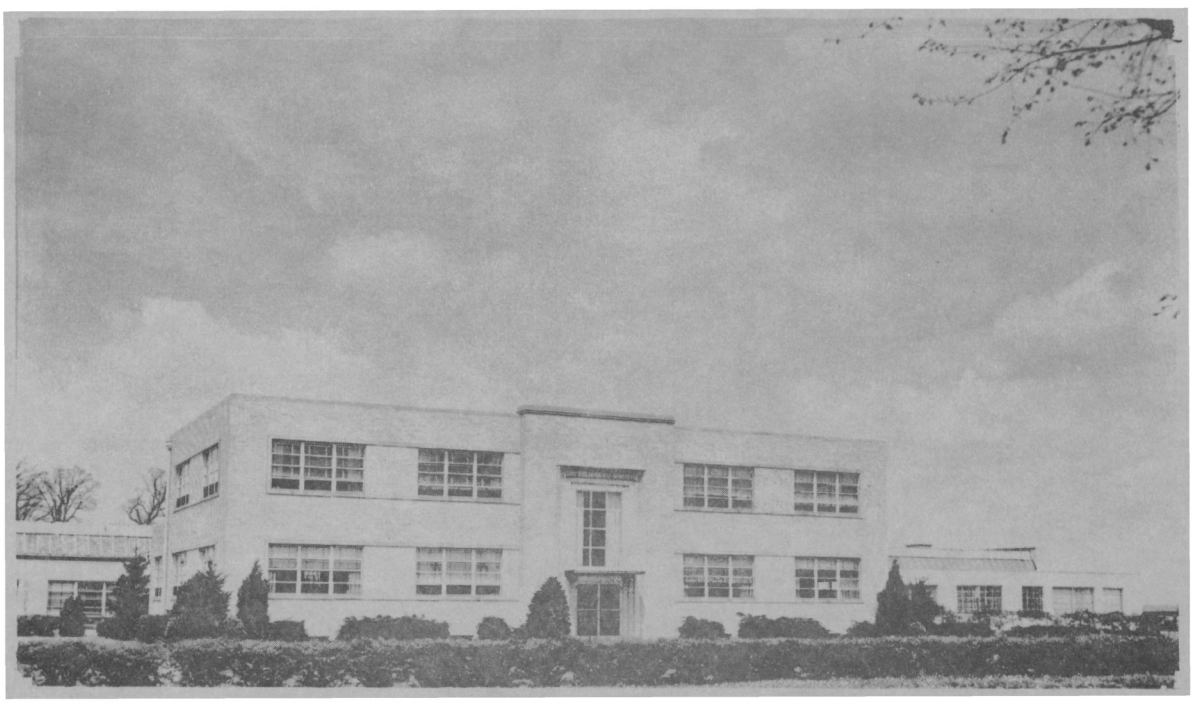

RESEARCH FOUNDATION

USNC-IGY ANTARCTIC GLACIOLOGICAL DATA
FIELD WORK 1958 AND 1959

(ELLSWORTH TRAVERSE, 1958-59)

Report 825-2-Part III
IGY Project No. 4.10
NSF Grant No. Y/4.10/285

Richard P. Goldthwait
December 1959

USNC-IGY ANTARCTIC GLACIOLOGICAL DATA

Report Number 2: Field Work 1958-59

Part III

ELLSWORTH TRAVERSE, 1958-59

by

Robert Goodwin

Ohio State University
Research Foundation
Columbus 12, Ohio

Project 825, Report No. 2, Part III

submitted by

Richard P. Goldthwait
Department of Geology

to the

U. S. National Committee for the IGY
National Academy of Sciences, in partial fulfillment
of IGY Project Number 4.10 - NSF Grant No. Y/4.10/285

December 1959

P R E F A C E

The data included in this report was collected in the field by Robert J. Goodwin. Reduction of the data at the Glaciological Data Reduction Center was accomplished by Robert J. Goodwin, Mrs. Faye Smith and George VanNeil.

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Robert J. Goodwin

ROUTINE GLACIOLOGICAL OBSERVATIONS

ELLSWORTH IGY STATION 1958-59

Ablation - Accumulation Studies

Measurements were taken of the amount of snow accumulated by wind and precipitation or lost by deflation, melting and sublimation over a network of 57 stakes set out around Ellsworth Station.

On the 25th of March 1958 a number of 1/4 inch diameter dowels were set out with 80 cm protruding above the snow surface. These replaced the stakes of the previous year which had a larger cross-sectional area and caused drifting which made accurate measurements difficult. All the stakes were measured to the nearest millimeter except a line of meteorology stakes which consisted of one inch square stakes graduated in inches and read to the nearest half-inch.

Sub-Surface Thermohms

On the 2nd of April 1958 the depth of the six thermohms situated in a temperature study plot approximately 100 yards southwest of the garage entrance was as follows:

No. 1	80	centimeters
No. 2	130	"
No. 3	280	"
No. 4	480	"
No. 5	880	"
No. 6	1680	"

Three stakes graduated in centimeters were set over the thermohms. These were measured to the nearest 1/2 centimeter and then averaged. These were read at the same time as the thermohms in order to calculate the weekly change in the depth of the thermohms.

Strain Pin Measurements

Clearly labeled strain pins have been inserted on the walls of the 30 meter deep pit dug in the winter of 1957 and along the walls, floor, and back of a 15 meter longitudinal tunnel at the 10 meter level dug in the winter of 1958. Measurements were taken to the nearest millimeter.

Sea Ice Observations

A log was kept of the sea ice in a small embayment approximately two miles north of Ellsworth Station.

The program was initiated in April 1958 and carried on until October 1958 when the glaciologists departed on an oversnow traverse to Byrd Station. The observations were made once a week, weather permitting. During periods of fog, snow, and moonless polar nights, all ice features and properties could not be determined. Fortunately the area chosen for these studies remained free of pressure ridging and rafting; whereas, practically all surrounding zones experienced extensive deformation in the form of 15 - 30 feet high pressure ridges and considerable rafting of the ice and with leads and cracks occurring from time to time. Data were recorded in the United States Navy H. O. Shore Station Observers Ice Log (PRNC-NHO-1367).

SNOW ACCUMULATION--ABLATION (Ellsworth 1957)

(Total accumulation for each stake in centimeters)

Line C

Date	C	C-1	C-2	C-3	C-4	C-5
10/27	29.1	- 7.0	16.3	17.7	9.0	7.5
11/3	19.1	- 7.0	14.8	17.8	8.9	7.8
11/10	17.5	-11.4	14.1	17.0	7.2	9.0
11/17	24.2	- 3.4	32.1	33.0	14.8	17.0
11/24	28.2	- 7.4	31.1	31.7	10.7	25.5
12/1	34.0	0.1	33.3	35.1	14.9	31.0
12/8	34.5	2.2	37.0	36.1	16.3	30.7
12/15	35.0	11.3	32.7	34.0	16.2	26.2
12/22	33.4	9.7	30.9	31.6	15.8	24.8
12/29	31.9	7.9	29.7	31.1	14.8	24.0

Line D

Date	D	D-1	D-2	D-3	D-4	D-5	D-6
10/27	12.5	36.5	20.5	13.7	17.5	4.5	10.0
11/3	15.7	36.3	21.0	14.1	17.0	4.2	10.4
11/10	12.8	34.0	20.9	14.0	16.6	0.5	9.9
11/17	18.6	41.5	32.4	29.4	28.0	9.7	31.0
11/24	21.5	34.1	33.3	29.7	24.0	16.9	26.0
12/1	17.4	37.2	40.5	34.7	28.0	19.5	28.5
12/8	23.0	39.5	44.5	37.3	30.0	22.2	32.7
12/15	20.8	37.0	41.0	32.1	24.2	18.9	31.1
12/22	24.5	38.2	44.0	35.9	24.5	19.2	30.3
12/29	27.0	37.8	44.2	35.0	25.7	18.5	29.0

SNOW ACCUMULATION--ABLATION (Ellsworth 1957)

(Total accumulation for each stake in centimeters)

Line Z

Date	Z	Z-1	Z-2	Z-3	Z-4	Z-5	Z-6
10/27	14.8	13.0	8.0	13.0	5.4	12.3	14.9
11/3	14.3	11.9	7.2	14.4	4.4	12.0	14.4
11/10	11.8	11.9	7.3	15.0	2.5	12.0	20.0
11/17	28.0	27.6	22.5	32.0	10.6	23.0	28.5
11/24	25.7	29.0	23.0	27.2	6.2	17.3	33.2
12/1	28.0	31.8	27.6	31.7	13.6	22.0	39.0
12/8	31.0	35.0	30.5	25.5	15.4	22.0	38.0
12/15	29.4	32.0	28.2	24.8	14.8	20.3	34.6
12/22	29.8	34.2	26.8	31.0	17.2	21.5	35.1
12/29	28.4	32.2	25.0	30.7	15.7	20.0	33.8

A- Line

Date	A	A- 1	A- 2	A- 3	A- 4	A- 5
10/27	3.5	46.0	19.5	37.5	8.6	32.5
11/3	0.8	45.9	20.0	37.4	10.6	33.1
11/10	1.0	44.4	19.0	33.8	8.8	32.7
11/17	8.6	53.0	23.8	41.0	17.3	36.0
11/24	15.8	51.0	23.2	39.5	12.6	34.0
12/1	16.5	54.5	30.3	43.1	21.7	40.2
12/8	18.6	51.7	33.8	46.0	21.2	44.0
12/15	18.7	52.3	29.6	41.3	23.3	41.5
12/22	17.0	52.3	30.2	43.6	24.3	42.0
12/29	16.6	49.8	28.0	42.5	22.6	40.2

ACCUMULATION (Ellsworth Station 1958)

AREA I

Date	Stake #1 Total Accumulation cm	Stake #2 Total Accumulation cm	Stake #3 Total Accumulation cm	Average Total Accumulation at 3 Stakes cm	Water Equivalent
1958					
3/26		Stakes reset March 26, 1958 with 100 cm extending above snow surface			
4/2	0.2	- 1.1	0.9	0.0	
4/9	3.6	6.2	0.4	6.1	1.34
4/16	7.0	2.7	5.7	5.1	1.34
4/23	3.1	12.8	5.5	7.1	2.77
4/30	5.4	3.1	6.5	5.0	2.06
5/7	3.0	5.8	9.0	5.9	2.59
5/23	2.7	12.3	7.3	7.4	3.16
6/6	3.0	11.0	16.0	10.0	4.11
6/17	20.0	8.7	16.4	15.1	5.36
6/30	16.4	24.0	34.6	25.0	13.38
7/30	53.0	34.0	16.0	34.0	9.49
8/7	28.7	35.3	20.0	28.0	6.89
8/14	31.0	44.0	21.0	32.0	11.30
8/21	31.0	33.0	20.0	28.0	8.60
8/28	31.0	33.0	20.0	28.0	8.74
9/4	46.0	39.0	35.0	40.0	14.48
9/19	41.0	38.0	35.0	38.0	12.20
9/26	41.0	38.0	34.0	38.0	13.83
10/2	42.0	38.0	34.0	38.0	12.92
10/10	41.0	40.0	33.0	38.0	13.11
10/21	40.0	40.0	43.0	41.0	14.27
10/28	40.1	40.8	51.4	44.1	13.45
11/6	40.6	44.9	49.7	48.7	16.07
11/14	41.5	49.4	53.8	48.2	17.06
11/21	44.5	55.7	52.5	50.9	19.04
11/29	41.1	51.5	47.7	46.8	17.22
12/8	43.0	50.2	49.2	46.8	17.13
12/15	44.5	50.0	49.0	47.8	19.55
12/29	42.8	48.3	47.3	46.1	17.29
1959					
1/14	47.2	51.7	49.2	49.4	21.00

ACCUMULATION (Ellsworth Station 1958)

AREA II

Date	Stake #1 Total Accumulation cm	Stake #2 Total Accumulation cm	Stake #3 Total Accumulation cm	Average Total Accumulation at 3 Stakes cm	Water Equivalent
1958					
4/2	- 0.3	0.2	- 0.4		
4/9	10.8	7.5	7.4	8.6	1.60
4/15	7.8	5.7	0.5	4.7	1.16
4/23	7.7	5.5	0.2	4.4	1.52
4/29	8.6	5.7	0.1	4.8	1.88
5/7	8.0	9.3	0.2	5.8	2.95
5/23	11.8	10.0	0.0	7.3	3.52
6/6	14.0	9.8	11.2	11.7	3.03
6/17	11.0	20.8	7.2	13.0	4.99
6/30	16.5	8.5	21.0	15.3	5.97
7/30	24.0	32.0	13.0	23.0	8.07
8/7	21.6	20.0	18.4	20.0	4.16
8/14	26.0	19.0	18.0	21.0	6.11
8/21	25.0	20.0	18.0	21.0	7.73
8/28	26.0	20.0	17.0	21.0	7.18
9/4	30.0	30.0	33.0	31.0	10.57
9/19	28.0	26.0	21.0	25.0	6.80
9/26	28.0	26.0	33.0	29.0	10.24
10/2	28.0	31.0	31.0	30.0	12.06
10/10	28.0	26.0	30.0	28.0	9.88
10/21	28.0	28.0	31.0	29.0	10.67
10/28	33.2	33.5	40.9	35.9	10.95
11/6	49.8	44.5	30.3	41.5	8.42
11/14	47.0	43.5	31.0	40.5	15.07
11/21	41.5	40.2	33.9	38.5	14.17
11/29	40.6	39.2	33.1	37.6	14.10
12/8	40.0	39.8	35.9	38.6	13.63
12/15	40.6	39.6	35.4	38.5	14.71
12/29	38.8	38.0	34.8	37.2	14.81

ACCUMULATION (Ellsworth Station 1958)

AREA III

Date	Stake #1 Total Accumulation cm	Stake #2 Total Accumulation cm	Stake #3 Total Accumulation cm	Average Total Accumulation at 3 Stakes cm	Water Equivalent
1958					
4/2	- 0.1	- 1.7	0.1		
4/9	7.8	11.2	3.3	7.4	1.87
4/15	0.2	6.9	0.1	2.4	0.80
4/23	0.0	6.8	0.0	2.3	
4/29	0.0	7.0	0.9	2.6	1.52
5/7	0.0	3.0	0.0	1.0	
5/23	0.0	6.7	0.3	2.3	1.53
6/6	2.0	6.9	2.1	3.7	0.72
6/17	3.0	6.0	4.4	4.5	1.25
6/30	2.2	15.8	4.0	7.3	4.20
7/30	4.0	18.0	5.0	9.0	3.38
8/7	2.9	18.1	6.0	9.0	3.22
8/14	5.0	17.0	8.0	10.0	5.37
8/21	5.0	18.0	7.0	10.0	4.83
8/28	5.0	24.0	7.0	12.0	3.58
9/4	14.0	23.0	11.0	16.0	5.57
9/19	8.0	12.0	7.0	9.0	2.16
9/26	7.0	22.0	7.0	12.0	2.32
10/2	11.0	23.0	9.0	14.3	5.21
10/10	7.0	22.0	10.0	13.0	4.47
10/21	12.0	22.0	8.0	14.0	5.12
10/28	24.9	32.8	25.5	27.7	6.90
11/6	25.5	32.1	24.4	27.3	8.79
11/14	25.5	31.4	24.4	27.1	10.05
11/21	24.8	30.7	23.3	26.3	8.60
11/29	24.3	29.8	22.7	25.6	10.00
12/8	24.6	29.1	22.0	25.2	10.42
12/15	24.4	28.8	21.4	24.9	9.51
12/29	24.1	27.4	20.3	23.9	11.66
1959					
1/14	28.0	33.2	20.8	26.7	10.68

WEEKLY ACCUMULATION-ABLATION VALUES

(In Centimeters)

Date	A	A-1	A-2	A-3	A-4	A-5
1958						
1/5	- 3.0	- 2.4	- 0.7*	-1.4	- 0.2	-0.9
1/12	+ 0.4	0.0	- 1.3	-1.1	0.0	+2.2
1/18	+ 1.5	- 0.1	- 0.3	+0.3	+ 1.6	+3.0
2/2	- 4.5	- 4.8	- 1.7	-1.8	- 3.0	-4.5
2/9	+ 4.0	+ 3.0	+ 1.4	-0.9	- 0.2	+0.7
2/24	- 0.5	- 0.4	- 1.2	-0.8	- 0.4	-0.9
3/2	+ 0.5	+ 0.1	+ 0.9	+0.5	+ 0.6	+0.6
3/7	+ 0.5	+ 0.6	+ 1.3	+1.4	+ 0.9	+0.9
3/13	+ 0.3	+ 0.9	+ 0.9	+0.8	+ 1.1	+2.7
3/23	+ 0.2	- 1.9	- 3.1	-0.7	- 1.5	-2.4
3/25	All stakes replaced by dowels set 80 cm above snow surface					
4/1	+ 1.6	+ 1.2	+ 0.7	+0.4	+ 1.2	+0.8
4/7	+47.0	+41.9	+13.5	+1.3	+ 0.2	+9.4
4/15	-31.6	-33.3	+ 3.5	0.0	- 0.5	-0.4
4/23	- 7.4	- 6.9	- 0.3	-0.1	+ 0.1	-2.9
4/30	+ 0.3	+ 4.3	+ 0.1	+8.0	- 0.2	-2.5
5/7	0.0	+ 4.4	- 0.1	-7.9	+ 0.2	+4.0
5/24	+ 1.1	0.0	- 0.8	0.0	0.0	-0.2
6/6			No Reading			
6/17	+ 0.5	+10.6	+ 0.2	+0.2	+ 2.0	+0.2
6/30	+ 0.1	+ 0.8	0.0	0.0	- 1.9	-0.4
7/21			No Reading			
7/30			No Reading			
8/7	+ 0.1	+37.4	+14.2	+5.1	+ 0.3	+0.5
8/14	- 0.1	-37.2	0.0	-5.2	- 0.1	-0.2
8/28	+ 0.1	+38.8	- 4.6	+0.5	+ 1.5	+6.7
9/4	+ 7.5	+ 5.2	+ 5.0	+8.6	+ 6.7	-1.8
9/19	- 0.7	- 1.2	- 1.5	-1.0	- 1.7	-1.0
9/26	- 0.1	- 0.4	+ 0.1	-0.3	+ 1.2	+0.1
10/2	+ 3.5	**	+ 0.1	+5.0	+ 0.5	+2.5
10/10	+ 6.4	- 0.2	- 0.5	+9.8	+ 1.2	+6.9
10/21	+ 4.0	0.0	- 0.3	-6.2	- 1.3	-2.7
10/29	- 1.4	- 0.1	- 0.4	+7.8	- 0.3	0.0
11/6	+11.8	+ 6.3	+ 9.6	+4.4	+ 5.0	+8.4
11/14	- 3.6	- 0.6	- 1.9	-0.7	- 0.1	-1.5
11/20	- 1.7	- 1.4	+ 0.1	+0.6	- 0.9	-0.7
11/29	- 0.6	+ 0.4	- 0.4	-0.5	+ 0.4	+0.6
12/8	- 0.4	+ 0.8	- 0.7	-0.8	+ 0.7	+2.2
12/15	- 0.4	- 0.3	+ 0.7	-0.1	- 1.2	-3.1
12/29	- 1.0	- 0.2	- 0.6	-1.2	- 0.7	-0.5
1959						
1/14	- 1.2	+ 3.3	+ 4.4	-0.5	+12.7	-1.5

*On stake 50 cm taped to original

**Reset to 50 cm

WEEKLY ACCUMULATION-ABLATION VALUES

(In Centimeters)

Date	C	C-1	C-2	C-3	C-4	C-5
1958						
1/5	- 0.1#	- 4.7	- 0.2	0.0	0.0	-3.8*
1/12	- 0.4	- 2.5	+ 1.9	+ 1.3	- 1.0	+0.5
1/18	+ 0.1	- 2.4	+ 1.3	---	+ 0.1	---
2/2	- 1.0	+ 2.9	- 2.2	- 5.4	- 1.6	-2.2
2/9	- 0.2	- 2.5	0.0	+ 3.8	- 0.3	+1.9
2/24	0.0	- 2.7	- 3.2	+10.8	- 3.0	-3.1
3/2	- 0.3	+ 0.7	- 0.1	+ 0.4	+ 1.3	+0.2
3/7	- 0.5	+ 1.7	+ 4.8	- 1.0	+ 3.5	+0.8
3/13	+ 0.5	+ 2.6	- 0.3	+ 2.5	- 0.7	-0.3
3/23	+ 2.5	+ 2.7	+ 2.0	- 4.1	+ 0.7	+3.2
3/25	All stakes replaced with 1/4" dowels set 80 cm above snow surface					
4/1	+13.0	+ 4.3	+ 0.3	- 0.4	+ 0.5	-0.8
4/7	+22.0	+ 3.0	+ 0.4	+ 0.2	-10.1	+4.6
4/15	- 0.4	+31.4	+ 7.3	+ 8.7	+13.1	-3.8
4/23	- 0.2	-26.7	- 3.6	- 7.5	+ 0.3	-0.5
4/30	- 0.3	+ 0.9	- 0.2	- 0.1	- 3.3	0.0
5/7	- 0.1	- 0.3	+ 4.3	- 0.1	+ 0.1	+0.5
5/24	0.0	0.0	0.0	- 0.3	0.0	-0.2
5/31	+ 0.3	- 0.2	0.0	+ 1.3	+ 1.3	-0.2
6/6	- 0.6	+21.3	+ 3.0	- 0.1	- 0.9	+1.2
6/17	+ 0.1	-19.7	- 2.9	+ 0.8	- 0.3	+0.4
6/30	+20.3	+ 3.2	0.0	- 1.5	0.0	-1.5
7/21	-20.3	- 0.2	+ 0.1	0.0	+ 0.1	+0.1
7/30	- 1.8	+10.2	+ 4.3	+ 0.5	+ 4.4	+0.2
8/7	+ 1.7	- 8.2	- 1.0	+ 4.1	- 4.2	+6.8
8/14	- 0.7	+ 1.6	- 0.5	+ 0.4	- 0.3	0.0
8/21	+ 0.8	+ 3.1	0.0	---	+ 0.3	+0.2
8/28	- 0.5	+ 6.3	+ 0.4	+ 0.3	0.0	-0.2
9/4	+ 0.6	- 2.9	+12.1	+ 3.1	+ 3.3	+2.6
9/19	- 0.2	- 0.1	- 0.3	- 0.8	- 2.4	-0.1
9/26	0.0	0.0	- 0.5	0.0	- 0.4	+0.1
10/2	+ 0.3	+ 1.8	+ 1.3	+ 0.5	+ 2.0	+1.4
10/10	- 0.1	- 2.1	- 1.3	- 0.5	- 1.8	-1.1
10/21	- 0.1	+ 0.2	+ 3.2	+ 0.1	+ 2.3	+2.8
10/28	+12.3	+11.7	+ 7.7	+ 0.1	- 1.5	+9.4
11/6	- 0.5	+12.9	+ 5.4	+ 6.7	+23.6	+5.3
11/14	- 0.3	- 2.3	- 1.2	- 4.8	- 3.9	-2.5
11/21	- 0.8	- 2.0	- 0.2	+ 1.6	- 2.2	+0.5
11/29	- 0.7	- 1.3	- 1.1	- 0.9	+12.9	-3.2
12/8	+ 1.2	+ 0.6	- 0.3	0.0	-15.0	+1.7
12/15	- 2.0	+ 0.6	- 0.1	- 0.2	- 0.3	-0.1
12/29	- 1.1	- 1.8	- 1.7	- 1.2	- 2.2	-1.2
1959						
1/14	- 1.8	0.0	+ 0.1	+ 0.6	- 1.5	-0.2

The area near these stakes used as a roadway from the ship to the base.

* On stake 50 cm taped to original.

WEEKLY ACCUMULATION-ABLATION VALUES

(In Centimeters)

Date	D	D-1	D-2	D-3	D-4	D-5	D-6
1958							
1/5	- 0.4	- 2.4	- 4.7#	- 0.2	- 2.7#	0.0	- 3.1
1/12	- 2.9	- 0.7	+ 1.1	- 2.8	--	- 2.7	- 0.5
1/18	+ 3.5	- 0.4	- 1.5	+ 0.2	--	+ 0.7	--
2/2	- 2.7	+ 0.2	- 0.1	+ 1.3	- 2.0	- 3.0	- 0.4
2/9	+ 1.3	- 1.3	- 1.5	- 1.0	- 0.1	+ 2.7	+ 0.2
2/24	- 0.6	- 1.1	+ 0.2	- 2.1	- 0.9	- 2.6	- 1.8
3/2	0.0	+ 0.6	+ 0.3	+ 0.7	+ 0.4	0.0	+ 0.3
3/7	- 0.1	+ 0.8	+ 0.9	+ 1.3	+ 1.1	+ 0.1	+ 0.5
3/13	+ 0.6	+ 0.9	+ 0.3	+ 1.4	+ 0.1	+ 2.2	- 0.2
3/23	- 4.4	- 0.6	+ 3.5	- 1.3	+ 1.6	- 3.4	+ 1.5
3/25	All stakes replaced by dowels set 80 cm above snow surface						
4/1	- 0.4	- 0.2	- 0.5	+ 7.4	+ 0.3	+ 0.6	+ 0.8
4/7	+ 7.0	+ 2.4	+ 5.3	+ 3.6	+ 4.0	+ 5.3	+ 5.7
4/15	- 2.0	+ 4.9	- 6.0	+ 1.3	- 4.5	- 5.3	- 3.3
4/23	- 0.1	- 5.3	- 0.2	- 3.6	+ 0.2	- 0.3	- 0.4
4/30	+ 0.3	+ 0.4	+ 7.8	+ 0.3	+ 2.4	+ 0.4	0.0
5/7	- 0.3	+ 0.1	- 2.0	- 0.1	- 3.1	- 0.2	- 1.5
5/24	+ 0.3	0.0	+ 1.6	- 0.2	+14.7	0.0	- 0.3
5/31	0.0	- 0.1	+ 9.9	+ 5.6	- 0.5	+ 0.2	+ 1.9
6/6	+ 4.6	+ 5.5	- 0.4	+ 2.1	- 9.9	+ 0.3	- 1.4
6/17	- 1.4	- 4.8	+ 2.5	- 4.9	+ 2.9	0.0	- 0.1
6/30	+ 5.2	+ 0.9	- 0.5	0.0	+ 7.2	- 0.1	+ 1.6
7/21	- 6.5	- 1.7	+ 0.5	0.0	- 2.0	+ 0.1	0.0
7/30	+ 3.5	+11.8	+ 0.8	+ 1.1	- 0.1	0.0	- 0.2
8/7	- 0.7	- 7.7	- 0.8	+ 0.1	- 0.2	0.0	- 0.1
8/14	+ 4.5	+ 2.0	+ 0.5	+ 0.2	+ 0.3	+ 0.2	- 0.2
8/21	+ 0.4	- 0.2	0.0	0.0	0.0	+ 0.1	+ 2.0
8/28	+ 9.8	0.0	- 0.1	0.0	- 0.1	- 0.1	+ 2.7
9/4	- 7.7	+14.7	+ 3.6	+ 4.6	+ 2.0	+11.0	+11.3
9/19	- 2.2	- 1.1	- 1.5	- 0.9	- 0.2	0.0	0.0
9/26	+ 0.4	- 0.9	+ 0.4	- 0.1	+ 0.1	- 0.3	- 1.3
10/2	+ 5.3	+ 2.1	+ 7.3	+ 0.4	0.0	+ 0.3	+ 0.3
10/10	- 3.1	- 2.1	+ 1.5	- 0.4	- 0.2	- 0.4	0.0
10/21	+ 0.3	+ 3.6	0.0	+ 0.4	+ 1.5	- 0.1	+ 0.3
10/28	+ 0.1	+ 1.2	- 0.1	+ 1.3	- 1.1	0.0	+ 0.1
11/6	+10.5	+ 8.5	+10.4	+21.6	+ 1.0	+ 6.4	+ 8.3
11/14	- 1.6	- 1.9	- 1.2	- 4.2	- 0.1	- 1.0	- 2.1
11/21	- 0.2	+ 0.3	- 1.1	- 1.8	- 1.2	- 5.6	- 1.1
11/29	- 0.7	- 1.0	- 0.8	- 1.6	- 0.7	- 0.3	- 0.3
12/8	- 0.5	- 0.2	+ 2.6	- 0.5	+ 0.3	+ 1.3	- 0.1
12/15	+ 0.1	- 0.3	- 2.0	- 0.7	- 1.0	- 1.5	- 0.5
12/29	- 1.2	- 1.5	- 3.1	- 0.8	- 1.1	- 1.0	- 1.0
1959							
1/14	+ 6.3	+ 1.7	+ 0.6	+ 1.9	+ 7.6	- 1.1	- 5.1

#The area near these stakes used as a roadway from the ship to the base.

WEEKLY ACCUMULATION-ABLATION VALUES

(In Centimeters)

Date	B	B+1	B+1.5	B+2	B+3	B+4	ΔA
1958							
1/5	- 0.2	- 1.0	- 0.8	- 0.7	0.0	- 1.0	-1.2
1/12	- 1.5	0.0	- 0.7	+ 0.2	- 0.5	- 0.2	-0.1
1/18	+ 6.2	- 3.7	- 1.8	- 1.4	- 2.5	- 0.2	-3.5
2/2	- 5.0	+ 2.8	+ 0.8	+ 0.3	+ 0.8	+ 0.9	-1.2
2/9	+ 1.5	- 2.9	- 1.5	+ 0.3	- 2.7	- 4.0	-0.5
2/24	- 1.2	- 0.7	- 1.7	+ 0.1	- 1.8	+ 1.6	-3.2
3/2	+ 1.2	- 0.1	+ 0.2	+ 0.2	+ 0.3	+ 0.1	+0.1
3/7	+ 2.6	- 0.3	+ 0.5	+ 0.1	+ 0.7	+ 0.1	0.0
3/13	- 0.5	+ 2.3	+ 1.1	- 0.5	+ 2.0	+ 0.5	+0.6
3/23	+ 3.5	+ 4.7	+ 3.0	+ 3.2	+ 3.2	+18.8	+4.9
3/25	All stakes replaced by dowels set 80 cm above snow surface						
4/1	- 0.3	+ 0.6	+ 1.8	+ 0.1	- 0.1	+ 3.6	
4/7	+12.6	+ 6.8	+ 6.3	+ 7.1	+ 2.8	+ 2.1	
4/15	- 0.6	- 1.1	+ 1.2	- 2.1	- 2.5	+ 1.6	
4/23	- 0.1	- 0.1	- 2.9	- 0.2	+ 0.1	- 2.3	
4/30	- 0.1	0.0	- 0.1	- 0.1	+ 0.3	+ 3.0	
5/7	+ 0.1	+ 0.3	+ 0.1	0.0	- 0.3	+ 5.4	
5/24	0.0	- 0.5	+ 6.6	0.0	- 0.3	+ 0.9	
5/31				No Reading			
6/6	+ 4.0	+ 0.4	0.0	+ 0.2	+ 2.7	+ 1.3	
6/17				No Reading			
6/30				No Reading			
7/21				No Reading			
7/30				No Reading			
8/7				No Reading			
8/14	- 2.3	+16.9	- 0.2	+ 0.2	+ 9.3	+ 9.4	
8/21				No Reading			
8/28	- 0.2	+ 0.2	+ 0.2	- 0.3	+15.4	- 0.2	
9/4	+ 9.0	+14.9	+13.0	+ 0.3	- 4.5	+ 3.0	
9/19	- 5.0	+ 0.3	- 0.3	+ 0.1	+ 0.4	+18.5	
9/26	- 0.1	+ 0.9	+ 0.1	- 0.2	- 0.7	+ 0.9	
10/2	+ 1.7	- 1.0	+ 0.1	+ 3.7	+ 0.5	+ 0.7	
10/10	- 1.7	- 1.2	- 0.3	- 3.6	- 0.3	+ 2.8	
10/21	+ 6.7	+ 0.8	0.0	+ 4.2	- 0.2	- 0.7	
10/28	+12.3	- 0.2	+ 1.8	- 0.3	+ 0.3	0.0	
11/6	- 0.7	- 0.6	+ 1.9	+14.1	+ 4.1	+ 0.5	
11/14	- 0.3	- 0.5	- 1.5	- 1.2	- 1.4	0.0	
11/21	- 1.2	- 0.8	+ 0.9	- 2.5	- 1.8	- 1.0	
11/29	- 0.7	- 1.6	- 1.2	- 1.3	- 0.1	- 0.8	
12/8	0.0	- 0.4	+ 0.2	+ 0.7	+ 0.1	+ 1.0	
12/15	- 1.0	+ 0.1	+ 2.4	- 0.9	+ 0.5	- 1.1	
12/29	- 1.2	- 2.4	- 1.4	- 0.9	- 1.4	- 1.4	
1959							
1/14	- 1.7	+ 1.1	- 2.2	+10.3	+ 4.7	- 0.2	

WEEKLY ACCUMULATION-ABLATION VALUES

(In Centimeters)

Date	Z+6	Z+5	Z+4	Z+3	Z+2	Z+1	Z+
1958							
1/5	- 0.3	0.0	- 0.4	- 0.2	- 0.2	- 0.2	- 0.4
1/12	- 0.3	- 2.5	- 1.1	- 1.3	+ 0.2	- 2.2	0.0
1/18	- 0.7	+ 1.0	- 3.5	- 0.2	- 1.0	+ 0.9	- 1.0
2/2	- 1.0	- 3.0	+ 1.0	- 2.5	- 3.0	- 4.7	- 2.0
2/9	- 0.1	+ 2.4	+ 0.2	+ 1.5	+ 1.7	+ 4.0	+ 0.8
2/24	- 0.2	- 0.7	- 0.4	- 2.5	- 0.5	- 1.4	+ 1.2
3/2	+ 0.3	+ 0.4	0.0	+ 0.5	+ 0.2	+ 0.2	0.0
3/7	+ 1.0	+ 0.7	+ 0.5	+ 3.0	+ 1.0	+ 1.6	+ 1.0
3/13	+ 2.0	+ 0.9	+ 0.7	+ 0.6	+ 0.2	+ 0.4	+ 2.2
3/23	+ 6.6	+ 0.7	+ 8.8	+ 1.3	+ 7.5	+ 2.6	+11.2
3/25	All stakes replaced by dowels set 80 cm above snow surface						
4/1	- 0.1	+ 0.1	0.0	+ 1.3	0.0	+ 0.9	- 0.2
4/7	+ 0.3	+ 4.2	+11.8	+ 4.7	+20.8	+ 9.5	+10.2
4/15	- 0.7	- 1.1	- 1.2	+ 0.4	- 4.4	- 0.7	- 1.5
4/23	- 0.2	- 2.3	+ 0.1	- 0.3	- 6.5	- 0.2	- 0.7
4/30	+ 0.2	- 0.9	+ 7.3	+ 1.6	+ 5.9	+ 0.3	+ 1.2
5/7	+ 0.1	+ 8.0	- 7.6	- 1.9	+ 1.6	+ 1.6	- 1.0
5/24	- 0.1	0.0	+ 5.7	+ 1.0	0.0	- 0.7	+ 0.3
5/30				No Reading			
6/6	+ 0.6	- 0.3	0.0	+ 3.2	0.0	+ 4.3	+ 6.7
6/17	+ 0.1	+ 0.3	+ 9.2	+11.0	+ 5.9	- 2.1	- 6.6
6/30				No Reading			
7/21				No Reading			
7/30				No Reading			
8/7	- 0.4	0.0	- 0.4	+ 5.6	+ 9.8	+10.3	+ 9.8
8/14	+ 0.8	+ 0.1	- 0.2	- 0.4	- 0.3	- 0.2	+ 0.5
8/28	+ 0.3	+ 0.3	+ 0.1	+ 1.1	+ 0.2	0.0	+11.8
9/4	+13.6	- 0.2	- 2.3	+12.2	+ 9.0	+21.9	- 8.5
9/19	- 0.1	0.0	+ 4.4	+ 7.4	- 3.4	- 1.6	- 1.0
9/26	- 0.1	+ 0.3	- 1.7	-11.3	+ 0.5	0.0	+ 0.7
10/2	0.0	- 0.1	+ 2.8	+ 8.0	+ 1.0	- 0.2	+ 1.0
10/10	+ 0.9	+13.0	+ 2.9	+ 5.6	- 1.1	- 0.5	+ 5.6
10/21	+ 2.6	- 7.6	+ 8.2	+ 1.5	+ 4.6	- 0.6	- 2.4
10/29	- 0.4	+ 0.1	- 0.3	- 0.3	+19.2	- 0.6	+ 5.1
11/6	- 0.1	+18.1	- 0.2	- 0.5	- 0.5	+19.6	+ 4.0
11/14	- 0.2	- 2.2	- 0.2	+ 0.3	- 0.5	- 4.3	- 1.0
11/20	0.0	- 6.4	- 0.9	+ 3.4	- 0.5	- 5.9	- 1.5
11/29	- 0.5	+ 1.6	- 0.1	- 0.2	- 0.8	+ 0.3	- 1.2
12/8	+ 0.3	- 0.5	- 0.5	- 0.9	- 0.4	+ 0.4	- 0.4
12/15	- 0.3	- 0.3	+ 0.9	- 0.9	+ 0.8	- 1.6	- 1.3
12/29	- 0.1	- 0.7	- 1.6	- 0.8	- 1.3	- 0.9	- 0.8
1959							
1/14	+ 0.9	+ 0.9	- 1.1	+ 3.1	+ 5.9	+ 0.6	- 1.2

WEEKLY ACCUMULATION-ABLATION VALUES

(In Centimeters)

Date	E1	E2	E3	E4	E5	E6	E7	E8
1958								
4/8	Stakes set April 8, 1958, 80 cm above snow surface							
4/15	- 1.2	0.0	+ 8.0	0.0	-2.8	+17.8	- 0.5	+ 1.3
4/23	+ 9.2	+ 2.5	-10.4	+ 0.2	+0.6	-16.1	- 0.6	+ 7.4
4/30	- 5.9	- 2.7	0.0	- 0.2	+7.0	+ 2.6	- 0.3	- 0.5
5/7	- 2.1	+ 5.3	- 0.1	+ 1.7	-6.4	- 2.9	+ 1.1	- 0.2
5/24	+ 3.0	0.0	+ 8.0	0.0	+4.9	+ 5.0	+ 2.0	0.0
5/31				No Reading				
6/6	+ 3.7	+ 1.9	+ 0.5	+ 4.5	-0.1	0.0	+ 0.2	- 0.5
6/17				No Reading				
6/30				No Reading				
7/21				No Reading				
7/30				No Reading				
8/7				No Reading				
8/14				No Reading				
8/21				No Reading				
8/28	+25.1	+13.2	+17.4	+18.6	+0.2	+29.1	+ 8.1	+ 0.1
9/4	+ 4.6	+ 4.8	+ 6.5	+ 0.2	+3.2	+ 0.7	+ 1.0	+ 1.2
9/19	- 0.3	+ 4.5	- 0.6	0.0	-0.2	- 0.7	- 1.1	+17.9
9/26	+ 0.1	+25.5	+ 9.0	0.0	+4.2	- 0.1	- 0.1	-18.7
10/2	+ 2.8	-19.9	+ 1.6	+ 0.8	-1.0	+ 3.1	+ 0.9	+ 3.2
10/10	+ 4.2	+19.6	+ 1.5	+ 7.8	-0.5	+ 0.1	+ 1.1	+ 5.2
10/21	- 0.4	-10.7	- 4.8	+ 3.9	+9.1	- 0.5	+10.7	+ 4.6
10/28	- 0.2	+10.0	- 0.3	+ 3.4	+7.5	- 0.1	- 0.4	+ 0.1
11/6	+ 6.8	+ 0.3	+ 3.9	- 2.5	-0.2	- 0.5	+ 6.7	+ 9.0
11/14	+ 0.2	0.0	- 1.0	- 0.1	-0.1	0.0	- 1.0	- 1.2
11/21	- 0.1	- 1.7	- 1.7	- 1.3	-0.7	- 0.8	- 1.0	- 1.5
11/29	+ 1.2	- 0.2	- 0.7	- 0.5	-0.6	- 0.3	- 0.2	- 0.3
12/8	- 0.5	0.0	+ 1.4	- 0.7	-0.1	- 0.5	+ 0.2	- 0.6
12/15	+ 0.4	+ 0.6	+ 0.8	- 0.1	-0.2	- 0.4	- 0.6	+ 0.3
12/29	- 1.6	- 1.4	- 1.7	- 0.9	-1.2	- 0.9	- 0.8	- 1.2
1959								
1/14	+ 1.2	- 2.9	- 0.1	- 0.9	+0.3	+ 2.7	+ 3.9	+ 2.1

WEEKLY ACCUMULATION-ABLATION VALUES

(In Centimeters)

Date	E9	E10	E11	E12	E13	E14	E15	E16
1958								
4/8		Stakes set April 8, 1958, 80 cm above snow surface						
4/15	+ 2.7	+13.2	- 4.0	- 0.6	-1.7	-1.5	- 2.5	+3.3
4/23	- 5.0	-13.6	- 5.0	+ 0.6	-1.5	-1.1	- 0.2	-4.6
4/30	- 0.2	0.0	+ 1.0	- 1.3	-0.1	-0.8	- 0.3	+1.8
5/7	+ 1.9	- 0.2	+ 2.9	+ 0.3	0.0	+0.4	+ 0.1	-3.1
5/24	+ 8.2	+ 0.2	+ 0.6	+ 0.3	+0.5	0.0	+ 0.3	+0.6
5/31				No Reading				
6/6	+ 3.4	- 0.2	+ 0.4	+ 0.8	+2.5	+6.5	+ 4.2	-0.3
6/17				No Reading				
6/30				No Reading				
7/21				No Reading				
7/30				No Reading				
8/7				No Reading				
8/14				No Reading				
8/21				No Reading				
8/28	+15.6	+17.9	+ 4.6	- 0.5	+1.3	+3.1	- 2.1	+4.1
9/4	+ 5.0	+ 5.4	+ 6.7	+10.6	+3.5	+1.1	+ 5.9	+3.5
9/19	- 0.9	+ 8.6	- 0.1	+ 0.7	-0.1	-1.2	- 0.9	-2.8
9/26	+12.3	- 8.6	- 0.4	- 1.4	0.0	+0.1	+ 0.5	+0.2
10/2	+ 0.5	+ 0.4	+ 1.4	+ 0.4	+2.7	+2.1	+ 1.4	+1.4
10/10	-10.7	0.0	+ 0.6	0.0	-2.1	-2.5	- 1.7	+6.3
10/21	+ 9.7	+ 6.6	- 1.8	+17.1	+0.2	+0.8	+ 3.1	-2.4
10/28	+ 3.5	+ 3.5	+12.9	- 4.7	-0.1	+1.7	+ 1.4	+5.4
11/6	+ 0.7	+ 6.2	+ 2.8	- 0.1	-0.2	-0.2	--	+7.8
11/14	- 0.1	- 0.7	+ 0.7	+ 0.8	+1.0	+1.1	+ 7.3	-0.8
11/21	- 0.6	+ 4.9	- 3.8	- 1.1	-1.1	-1.8	- 2.7	-1.2
11/29	0.0	- 0.5	+ 0.3	+ 0.1	0.0	+0.6	+ 0.9	-0.1
12/8	0.0	- 0.8	+ 0.5	- 0.1	+1.0	+1.7	- 0.3	-0.3
12/15	- 1.6	- 0.7	- 1.3	+ 1.6	+2.5	-0.2	- 0.8	+0.2
12/29	- 1.2	- 1.4	- 1.0	- 0.9	-0.1	-0.3	- 0.6	-0.7
1959								
1/14	+11.9	- 0.9	- 0.1	- 2.9	+3.0	+2.8	+11.1	+1.5

WEEKLY ACCUMULATION-ABLATION VALUES

Met Stakes

(In Centimeters)

Date	A	A+1	A+2	A+3	A+4	A+5	A+6	A+7	A+8
1958									
1/5		+ 1.3	0.0	0.0	+ 1.2	0.0	+ 2.5	+ 2.5	+1.3
1/12		+ 1.3	0.0	+ 2.5	0.0	+ 2.6	0.0	+ 1.3	0.0
1/18		- 2.6	+ 1.3	- 3.8	- 3.8	- 1.3	- 3.8	+ 2.5	-2.5
2/2		+ 2.6	0.0	+ 1.3	+ 3.8	+ 1.3	+ 5.1	- 1.2	+5.0
2/9		0.0	0.0	0.0	- 1.2	0.0	- 1.3	0.0	-1.2
2/24		0.0	+ 1.3	+ 2.5	- 1.3	0.0	+ 1.3	0.0	-1.3
3/2		- 1.3	0.0	- 1.3	0.0	0.0	- 1.3	0.0	0.0
3/7		- 1.3	- 1.3	+ 1.3	0.0	0.0	- 1.3	- 1.3	0.0
3/13		0.0	0.0	- 2.5	0.0	0.0	+ 2.6	+ 1.3	0.0
3/23		-10.1	- 2.5	0.0	- 2.5	0.0	- 2.6	- 5.1	-7.6
4/1	- 1.3	+ 5.1	0.0	+13.7	- 2.6	0.0	- 1.2	- 2.6	0.0
4/7	- 1.3	- 5.1	- 2.5	- 3.8	- 7.6	-20.3	- 1.3	+ 2.6	-7.6
4/15	- 1.3	0.0	0.0	+ 3.8	0.0	+ 5.0	- 1.3	- 5.1	0.0
4/23	+ 1.3	- 1.1	0.0	- 1.3	0.0	- 2.5	+ 1.3	- 5.0	-5.0
4/30	0.0	+ 1.1	0.0	- 1.3	+ 1.3	0.0	- 7.6	+ 7.5	0.0
5/7	- 1.3	- 1.1	0.0	- 7.6	- 1.3	- 1.3	+ 2.5	- 1.1	0.0
5/24	- 1.2	+ 1.1	- 7.6	+ 5.1	0.0	- 2.7	- 7.6	- 9.0	0.0
5/31					No Reading				
6/6	0.0	0.0	0.0	- 5.1	- 5.1	- 1.1	0.0	- 2.5	0.0
6/17					No Reading				
6/30					No Reading				
7/21					No Reading				
7/30					No Reading				
8/7					No Reading				
8/14					No Reading				
8/21	- 5.0	- 1.1	-15.4	- 8.8	- 5.0	- 7.5	-26.7	- 2.5	-1.7
8/28					No Reading				
9/4	- 7.7	-11.5	+ 2.7	- 2.6	- 4.0	- 1.7	+ 1.3	- 7.7	-6.2
9/19	0.0	0.0	+ 1.3	- 2.5	--	0.0	- 2.5	- 1.3	0.0
9/26	+ 2.5	0.0	- 1.3	- 2.5	- 1.1	0.0	+ 1.2	+ 1.3	-7.5
10/2	- 1.3	- 1.4	- 2.7	0.0	0.0	- 2.3	- 1.2	0.0	-1.3
10/10	0.0	+ 1.4	+ 5.3	+ 2.5	- 3.9	+ 2.3	+ 1.2	-10.2	0.0
10/21	- 1.2	- 2.5	- 6.4	- 2.5	+ 1.4	0.0	+ 1.3	- 2.5	-3.7
10/28	--	- 1.4	- 1.4	0.0	-10.4	- 9.7	- 8.8	- 5.0	-2.5
11/6	0.0	- 1.2	- 1.1	- 5.2	- 6.2	+ 1.2	+ 1.3	- 1.2	-3.8
11/14	- 2.6	0.0	0.0	+ 2.6	+ 5.1	+ 1.3	0.0	0.0	+1.3
11/21	- 2.6	0.0	- 2.6	+ 2.6	- 1.4	- 1.3	0.0	+ 3.7	+1.3
11/29	0.0	- 1.3	+ 3.7	0.0	+ 1.4	+ 2.5	+ 2.5	+ 2.5	+2.6
12/8	0.0	0.0	- 2.5	- 1.4	- 1.4	- 1.2	- 2.5	- 2.5	-2.6
12/15	+ 1.4	0.0	0.0	- 1.2	+ 1.4	- 1.3	- 1.3	0.0	-1.3
12/29	+ 1.2	0.0	+ 2.5	+ 3.7	+ 3.8	+ 2.5	+ 1.3	+ 1.2	+5.0
1959									
1/14	- 2.6	- 2.6	- 5.0	- 7.6	- 2.7	- 1.2	+ 2.5	- 3.7	-6.3

ACCUMULATION-ABLATION SUMMARY TABLE

Date	No. of Stakes	Accumulation	Ablation	Net Difference	Weekly Average
1958					
1/5	41	8.8	37.5	- 28.7	-0.7
1/12	40	15.5	26.3	- 10.8	-0.3
1/18	37	24.2	42.0	- 17.8	-0.5
2/2	41	30.1	64.5	- 34.4	-0.8
2/9	41	31.4	23.4	+ 8.0	+0.2
2/24	41	19.0	42.2	- 23.2	-0.6
3/2	41	11.8	4.4	+ 7.4	+0.2
3/7	41	35.2	7.1	+ 28.1	+0.7
3/13	41	35.2	5.0	+ 30.2	+0.7
3/23	41	97.9	53.8	+ 44.1	+1.1
4/1	41	60.3	10.7	+ 49.6	+1.2
4/7	41	278.6	59.6	+219.0	+5.3
4/15	57	129.5	130.5	- 1.0	-0.02
4/23	57	23.9	154.8	-130.9	-2.3
4/30	57	67.3	29.0	+ 38.3	+0.7
5/7	57	47.0	55.2	- 8.2	-0.1
5/24	57	72.0	31.7	+ 40.3	+0.7
5/31	13	20.5	1.0	+ 19.5	+1.5
6/6	51	90.0	28.5	+ 61.5	+1.2
6/17	26	46.9	42.8	+ 4.1	+0.2
6/30	19	39.3	5.9	+ 33.4	+1.8
7/21	13	0.9	30.7	- 29.8	-2.3
7/30	13	36.8	2.1	+ 34.7	+2.7
8/7	26	105.8	23.7	+ 82.1	+3.2
8/14	32	46.9	48.1	- 1.2	-0.04
8/21	21	6.9	73.9	- 67.0	-3.2
8/28	48	255.1	8.9	+246.2	+5.1
9/4	57	266.7	69.3	+197.4	+3.5
9/19	56	64.1	43.5	+ 20.6	+0.4
9/26	57	62.7	60.1	+ 2.6	+0.05
10/2	56	76.8	32.4	+ 44.4	+0.8
10/10	57	115.7	54.1	+ 61.6	+1.1
10/21	57	115.8	61.6	+ 54.2	+1.0
10/29	56	139.9	52.1	+ 87.8	+1.6
11/6	56	275.1	25.5	+249.6	+4.5
11/14	57	21.7	56.4	- 34.7	-0.6
11/21	57	19.9	72.4	- 52.5	-0.9
11/29	57	34.5	27.3	+ 7.2	+0.1
12/8	56	18.9	39.6	- 20.7	-0.4
12/15	56	15.3	32.2	- 16.9	-0.3
12/29	57	21.2	53.9	- 32.7	-0.6
1959					
1/14	57	109.7	58.8	+ 50.9	+0.9

DEEP THERMOHM TEMPERATURES

Date	Air Temp. °C.	Snow Surface Temp. °F.	0 Cal. °C.	Temp. No. 1	Depth cm	Temp. No. 2	Depth cm	Temp. No. 3	Depth cm	Temp. No. 4	Depth cm	Temp. No. 5	Depth cm	Temp. No. 6	Depth cm
1958															
1/5	- 3.9		-2.1	-10.6	68	-14.3	118	-20.9	268	-24.1	468	-24.7	868	-25.2	1668
1/12	- 9.3		-2.1	-10.6	68	-13.8	118	-20.1	268	-23.7	468	-24.7	868	-25.2	1668
1/18	- 4.4	-30.6	-2.1	- 9.4	68	-12.9	118	-19.1	268	-23.3	468	-24.7	868	-25.1	1668
1/25	- 7.2	-28.3	-2.0	-10.4	68	-12.8	118	-18.5	268	-22.9	468	-24.7	868	-25.2	1668
2/2	- 9.4	- 9.4	-2.2	-12.2	67	-13.0	117	-18.5	267	-22.5	467	-24.7	867	-25.2	1667
2/9	-12.8	-13.3	-2.2	-12.6	66	-13.7	116	-18.1	266	-22.1	466	-24.6	866	-25.1	1666
2/24	-17.2	-15.6	-2.2	-16.5	77	-16.8	127	-18.4	277	-21.4	477	-24.6	877	-25.2	1677
3/2	-20.0	-20.0	-3.1	-17.1	78	-17.3	128	-18.5	278	-21.3	478	-24.5	878	-25.1	1678
3/7	-21.4	-21.4	-7.0	-18.4	79	-17.7	129	-18.6	279	-21.2	479	-24.3	879	-25.2	1679
3/14		-22.8				Blowing snow--No readings									
3/26	-16.7	-20.8	-2.1	-21.7	81	-19.8	131	-19.3	281	-21.0	481	-24.1	881	-25.0	1681
4/2	-26.1	-27.6	-3.3	-25.1	80	-20.0	130	-19.8	280	-21.1	480	-24.2	880	-25.1	1680
4/9	-20.0	-25.9	-3.5	-21.0	84	-21.7	134	-20.4	284	-21.1	484	-24.1	884	-25.1	1684
4/16	-34.5	-34.7	-2.5	-23.6	84	-22.0	134	-20.8	284	-21.3	484	-24.0	884	-25.2	1684
4/23	-34.0	-35.3	-2.7	-28.9	84	-24.2	134	-21.2	284	-21.4	484	-23.9	884	-25.1	1684
4/30	-27.8	-29.2	-2.6	-30.6	88	-26.9	138	-21.9	288	-21.6	488	-23.9	888	-25.1	1688
5/7	-30.0	-32.5	-2.8	-29.5	87	-26.7	137	-22.8	287	-21.8	487	-23.9	887	-25.1	1687
5/20	-40.0	-38.4	-2.6	-34.2	88	-29.3	138	-23.8	288	-22.3	488	-23.7	888	-25.0	1688
5/29	-33.3	-32.8	-2.7	-32.5	88	-30.5	138	-25.3	288	-22.7	488	-23.8	888	-25.1	1688
6/5	-15.3	-21.1	-2.6	-30.6	88	-29.6	138	-25.8	288	-23.2	488	-24.0	888	-25.2	1688
6/13	-28.3	-29.2	-2.7	-32.5	90	-29.3	140	-26.0	290	-23.5	490	-23.8	890	-25.2	1690
6/23	-27.2	-29.0	-2.6	-34.1	92	-30.6	142	-26.3	292	-23.9	492	-23.8	892	-25.2	1692
6/30	-28.8	-32.8	-2.7	-31.0	90	-29.8	140	-26.6	290	-24.2	490	-23.8	890	-25.2	1690
7/9	-28.9	-29.2	-2.6	-32.6	90	-29.8	140	-26.9	290	-24.6	490	-23.8	890	-25.2	1690
7/19	-40.0	-42.2	-2.8	-34.6	91	-31.5	141	-27.3	291	-24.9	491	-23.9	891	-25.1	1691
7/29	-23.3	-23.4	-2.5	-30.9	90	-31.0	140	-27.8	290	-25.2	490	-23.9	890	-25.0	1690
8/7	-23.0	-23.4	-2.7	-31.5	107	-30.0	157	-27.9	307	-25.4	507	-24.0	907	-25.1	1707
8/14	-40.0	-37.2	-2.6	-30.2	110	-29.9	160	-28.0	310	-25.7	510	-24.0	910	-25.1	1710
8/21	-23.3	-26.0	-2.6	-32.6	110	-30.5	160	-28.0	310	-25.9	510	-24.1	910	-25.2	1710
8/28	-26.1	-23.4	-2.6	-33.0	110	-30.9	160	-28.0	310	-26.0	510	-24.1	910	-25.0	1710
9/2	-23.0	-13.5	-2.6	-30.6	110	-30.6	160	-27.8	310	-25.9	510	-23.9	910	-24.0	1710
9/9	-25.5	-29.1	-2.6	-28.8	110	-29.0	160	-28.2	310	-26.2	510	-24.2	910	-25.1	1710
9/19	-34.4	-36.4	-3.4	-32.8	110	-30.8	160	-28.6	310	-26.9	510	-25.0	910	-25.1	1710

1958-1959 IGY

Ellsworth Traverse

Map for

Report 825-2 Part III

WEDDELL SEA

FILCHNER ICE SHELF

ELLSWORTH

PENSACOLA MOUNTAINS

MARIE BYRD LAND

BYRD

STA A
STA B
STA C
STA D
STA E
STA F
STA G
STA H
STA I
STA J
STA K
STA L
STA M
STA N
STA O
STA P
STA Q
STA R
STA S
STA T
STA U
STA V

1958-59 IGY ELLSWORTH TRAVERSE

LEGEND

- FALL TRAVERSE 58
- ELLS.-BYRD TRAVERSE
- CREVASSES
- MOUNTAIN RANGES
- SHELF ICE
- NUNATAKS
- ICE CLIFFS
- DISTURBED ICE AREA
- TRAVERSE STATION
- GLACIERS
- IGY STATION

NOTES

MAP BASED ON US NAVY HYDROGRAPHIC OFFICE 1958 AIR NAVIGATION CHARTS V30-SP5, SP6, SP7, SP8, AND 1958-59 ELLSWORTH TRAVERSE. TRAVERSE DATA FROM R.J. GOODWIN, DRAFTED BY G.A. VAN NIEL

SCALE AT 85° SOUTH LATITUDE

50 0 50 100 MILES

DEEP THERMOHM TEMPERATURES
(Continued)

Date	Air Temp. °C.	Snow Surface Temp. °F.	0 Cal. °C.	Temp. No. 1	Depth cm	Temp. No. 2	Depth cm	Temp. No. 3	Depth cm	Temp. No. 4	Depth cm	Temp. No. 5	Depth cm	Temp. No. 6	Depth cm
1958															
9/26	-17.8	-20.0	-2.5	-29.6	110	-30.2	160	-28.1	310	-26.4	510	-24.4	910	-25.1	1710
10/2	-20.0	- 3.2	-2.5	-27.6	110	-28.5	160	-28.1	310	-26.4	510	-24.4	910	-25.1	1710
10/9	-25.0	5.9	-2.6	-28.3	110	-28.2	160	-28.0	310	-26.6	510	-24.6	910	-25.2	1710
10/13	-19.4	- 5.9	-2.4	-26.5	111	-27.8	161	-27.7	311	-26.6	511	-24.6	911	-25.1	1711
10/21	-17.8	1.8	-2.5	-26.2	111	-26.9	161	-27.4	311	-26.5	511	-24.6	911	-25.1	1711
10/29	-19.2	1.3	-2.2	-25.8	110	-26.7	160	-27.1	310	-26.3	510	-24.4	910	-25.0	1710
11/4	-16.1	3.5	-2.2	-23.6	111	-25.2	161	-26.7	311	-26.3	511	-24.5	911	-25.0	1711
11/8	-15.4	1.2	-2.2	-22.5	113	-24.3	163	-26.2	313	-26.2	513	-24.5	913	-25.0	1713
11/13	- 8.0	21.5	-2.2	-21.4	114	-23.7	164	-26.1	314	-26.1	514	-24.6	914	-24.8	1714
11/17	-15.6	9.2	-2.2	-19.7	113	-22.8	163	-25.8	313	-26.0	513	-24.6	913	-24.9	1713
11/22	-19.2	16.1	-2.2	-19.4	112	-21.9	162	-25.4	312	-25.9	512	-24.6	912	-24.9	1712
11/26	-15.3	16.5	-2.2	-18.9	112	-21.3	162	-25.1	312	-25.8	512	-24.6	912	-24.9	1712
12/2	-13.7	12.5	-2.2	-18.3	111	-20.6	161	-24.6	311	-25.6	511	-24.6	911	-24.9	1711
12/10	- 7.6	20.2	-2.2	-18.0	113	-20.2	163	-24.0	313	-25.4	513	-24.8	913	-24.9	1713
12/15	- 8.9	10.9	-2.2	-16.8	111	-19.4	161	-23.6	311	-24.2	511	-24.7	911	-24.9	1711
12/23	- 3.6	28.2	-2.2	-15.4	111	-18.2	161	-23.0	311	-25.0	511	-24.8	911	-24.9	1711

STRAIN PIN MEASUREMENTS--ELLSWORTH DEEP PIT

August 1957 - June 1958

(Horizontal Measurements)

Strain Pin Nos.	Readings cms 1957	1958	Difference 1957 - 1958	Strain Pin Nos.	Readings cms 1957	1958	Difference 1957 - 1958
01S-601	202.3	203.1	+0.8	17S-617	194.8	195.1	+0.3
02S-602	201.1	200.2	-0.9	18S-618	192.8	192.8	0.0
03S-603	199.9	201.1	+1.2	19S-619	193.5	193.0	-0.5
04S-604	201.9	201.9	0.0	20S-620		198.0	
05S-605	197.6	197.0	-0.6	21S-621	148.25	148.2	-0.1
06S-606	200.2	199.8	-0.4	22S-622	151.2	151.3	+0.1
07S-607	199.7	199.3	-0.4	23S-623	150.8	151.0	+0.2
08S-608	198.0	197.7	-0.3	24S-624	150.7	150.4	-0.3
09S-609	196.5	196.3	-0.2	25S-625	151.9	151.8	-0.1
10S-610	193.3	192.9	-0.4	26S-626	151.5	151.3	-0.2
11S-611	193.5	193.7	+0.2	27S-627	152.4	152.5	+0.1
12S-612	196.4	196.0	-0.4	28S-628	151.0	150.8	-0.2
13S-613	194.65	194.3	-0.4	29S-629	154.0	153.9	-0.1
14S-614	197.2	197.3	+0.1	30S-630	153.2	153.1	-0.1
15S-615	193.1	192.8	-0.3	31S-631	149.0	148.9	-0.1
16S-616	193.0	193.1	+0.1	32S-632	161.0	161.0	0.0

(Vertical Measurements)

601-602	100.0	96.3	-0.7	626-627	101.6	101.1	-0.5
602-603	100.5	98.5	-2.0	627-628	99.9	100.0	+0.1
603-604	99.8	96.9	-2.9	628-629	100.25	99.9	-0.3
604-605	100.1	97.9	-2.2	629-630	101.1	100.8	-0.3
605-606	99.8	98.4	-1.4	630-631	100.6	100.4	-0.2
606-607	100.2	98.6	-1.6	631-632	99.6	99.2	-0.4
607-608	100.1	98.8	-1.3	1S- 2S	93.1	89.8	-3.3
608-609	100.4	99.1	-1.3	2S- 3S	99.9	97.0	-2.9
609-610	99.7	98.8	-0.9	3S- 4S	100.1	97.2	-2.9
610-611	100.0	99.5	-0.5	4S- 5S	97.0	95.2	-1.8
611-612	100.4	99.5	-0.9	5S- 6S	102.9	100.3	-2.6
612-613	100.2	99.6	-0.6	6S- 7S	101.4	99.9	-1.5
613-614	100.5	99.8	-0.7	7S- 8S	100.1	99.2	-0.9
614-615	99.5	99.0	-0.5	8S- 9S	99.6	98.2	-1.4
615-616	100.8	100.1	-0.7	9S-10S	102.2	100.6	-1.6
616-617	99.4	99.0	-0.4	10S-11S	100.8	99.4	-1.4
617-618	100.4	100.0	-0.4	11S-12S	100.1	99.9	-0.2
618-619	101.1	100.7	-0.4	12S-13S	100.5	99.7	-0.8
619-620	99.5	99.0	-0.5	13S-14S	99.7	99.1	-0.6
620-621	100.1	99.7	-0.4	14S-15S	101.0	98.5	-2.5
621-622	100.7	100.3	-0.4	15S-16S	101.3	100.4	-0.9
622-623	100.5	100.0	-0.5	16S-17S	99.5	98.9	-0.6
623-624	100.0	99.4	-0.6	17S-18S	99.8	99.1	-0.7
624-625	100.3	99.9	-0.4	18S-19S	100.45	99.9	-0.6
625-626	100.2	99.1	-1.1	19S-20S	99.8	99.3	-0.5

STRAIN PIN MEASUREMENTS--ELLSWORTH DEEP PIT (Continued)

(Vertical Measurements)

Strain Pin Nos.	Readings cms 1957	1958	Difference 1957 - 1958	Strain Pin Nos.	Readings cms 1957	1958	Difference 1957 - 1958
20S-21S	98.9	99.4	+0.5	26S-27S	101.6	101.3	-0.3
21S-22S	100.5	100.1	-0.4	27S-28S	90.5	90.2	-0.3
22S-23S	99.9	99.7	-0.2	28S-29S	100.1	99.7	-0.4
23S-24S	98.8	98.4	-0.4	29S-30S	99.6	99.7	+0.1
24S-25S	102.0	101.5	-0.5	30S-31S	101.0	100.6	-0.4
25S-26S	99.2			31S-32S	100.0	99.7	-0.3

(Diagonal Measurements)

01S-602	198.9	195.7	-3.2	17S-618	187.3	187.0	-0.3
02S-603	199.0	196.4	-2.6	18S-619	188.9	188.7	-0.2
03S-604	201.4	198.4	-3.0	19S-620	194.3	193.8	-0.5
04S-605	198.7	196.3	-2.4	20S-621		192.8	
05S-606	196.4	194.2	-2.2	21S-622		184.1	
06S-607	198.8	197.5	-1.3	22S-623	154.4	154.5	+0.1
07S-608	197.3	195.9	-1.4	23S-624	154.3	153.8	-0.5
08S-609	194.1	192.9	-1.2	24S-625	159.9	152.5	-7.4
09S-610	193.7	192.7	-1.0	25S-626	154.1	153.8	-0.3
10S-611	190.1	189.2	-0.9	26S-626	151.9	151.9	0.0
11S-612	192.2	191.3	-0.9	27S-628	148.3	148.0	-0.3
12S-613	191.8	191.1	-0.7	28S-629	157.5	157.1	-0.4
13S-614	194.3	193.6	-0.7	29S-630	157.1	156.7	-0.4
14S-615	188.8	188.3	-0.5	30S-631	152.9	152.5	-0.4
15S-616	188.2	187.6	-0.6	31S-632	160.0	160.2	+0.2
16S-617	189.5						

(Pit Closure Measurements)

4N-604	264.3	263.2	-1.1	26E-26N	219.1	219.2	+0.1
4E- 4W	257.4	261.0	+3.6	26E-626	247.3	207.2	-0.1
4E- 4N		216.0		26W-26N	267.0	268.0	+1.0
4E-604	337.8	338.0	+0.2	20N-621		208.3	
4W- 4N	346.7	343.0	-3.7	20E-20W	193.2	193.4	+0.2
9N-609	217.6	216.3	-1.3	20E-20N		220.4	
9E- 9W	203.6	203.2	-0.4	20E-620	299.8	298.0	-1.8
9E- 9N		248.5		20W-20N	296.7	295.0	-1.7
9E-609	310.6	298.8	-2.8	30N-630	150.4	150.5	+0.1
9W- 9N	322.5	320.9	-1.6	30E-30W	127.1	128.1	+1.0
14N-614	258.6	258.7	+0.1	30E-30N	204.7	204.5	-0.2
14E-14W	224.4	223.1	-1.3	30E-630	239.4	240.0	+0.6
14E-14N		227.0		32N-632	137.4	137.3	-0.1
14E-614	318.7	320.5	+1.8	32E-32W	126.9	127.2	+0.3
14W-14N	347.5	341.7	-5.8	32E-32N	183.2	184.2	+1.0
26N-626	169.1	168.4	-0.7	32E-632	222.8	219.0	-3.8
26E-26W	151.8	151.7	-0.1	32W-32N	228.5	235.0	+7.5

TABLES FOR SHORE STATION OBSERVERS ICE LOG

TABLE A: DAY OF WEEK (GCT)

Sunday	1
Monday	2
Tuesday	3
Wednesday	4
Thursday	5
Friday	6
Saturday	7

TABLE B: TYPE OF ICE

No ice	0
Sea ice	1
Bay ice	2
Fiord ice	3
Lake ice	4
River ice	5
Other	6

TABLE C: SKY MAP

Feature not present		0
Water sky to	(East	1
	(South	2
	(West	3
	(North	4
Snow or iceblink to	(East	5
	(South	6
	(West	7
	(North	8
Feature not determined		9

TABLE D: SET OF ICE NEAREST SHORE

No drift ice		0
Station on open sea:		
Ice setting	(East	1
	(South	2
	(West	3
	(North	4
Stations on bays and fiords:		
Ice setting	(parallel to shore	
	(away from sea	5
	(parallel to shore	
	(toward sea	6
Either type station:		
All ice motionless		7
Set not determined		9

TABLE 1. CONCENTRATION: TOTAL AND BY SIZE

No ice	0
Open water--less than 1/10	1
Scattered ice--1/10 to 5/10	2
Broken ice--5/10 to 8/10	3
Close ice--8/10 to 10/10	4
Consolidated ice--10/10. No sea surface	5
Not determined	9

TABLE 2. RELIEF

No sea ice	0
Less than 6 inches	1
6 inches to 2 feet	2
Greater than 2 feet	3
Not determined	9

TABLE 3. TOPOGRAPHY

No sea ice	0
Slush or ice cakes	1
Flat ice	2
Rafted ice	3
Ridged ice	4
Hummocks	5
Screw ice	6
Not determined	9

TABLE 4. AGE

No sea ice	0
Slush, pancake, or ice crust	1
Young ice	2
Winter ice	3
Polar ice	4
Not determined	9

TABLE 5. PUDDLING

No puddles	0
Puddles frozen	1
Puddles--less than 1/10 ice area	2
Puddles--1/10 to 3/10 ice area	3
Puddles--greater than 3/10 ice area	4
Puddles--"melted through"	5
Puddles joined, extensive cracking	6
Rotten, disintegrating ice	7
Puddling not determined	9

TABLES FOR SHORE STATION OBSERVER'S ICE LOG
(Continued)

TABLE 6. SNOW COVER

Trace or no snow	0
Less than 6 inches	1
6 to 12 inches	2
12 to 18 inches	3
18 to 24 inches	4
24 to 30 inches	5
Over 30 inches	6
Snow in drifts	7
Continuous snow cover	8
Snow not determined	9

TABLE 7. WATER FEATURES

Open water or scattered ice	0
Broken ice	1
Two or more polynyas	2
Two or more leads	3
One polynya	4
One lead	5
Two or more cracks	6
One crack	7
No water features	8
Not determined	9

TABLE 8. ORIENTATION

No distinct orientation	0
NE - SW	1
E - W	2
SE - NW	3
N - S	4
Parallels shore at East	5
Parallels shore at South	6
Parallels shore at West	7
Parallels shore at North	8
Not observed	9

TABLE 9. FAST ICE

Shore not observed	0
Shore entirely clear	1
Ice blocking less than 1/2 shore	2
Ice blocking more than 1/2 shore but some openings	3
Ice blocking entire shore	4
Not determined	9

TABLE 10. ICE OF LAND ORIGIN

No land ice	0
Less than 100 growlers	1
100 or more growlers	2
Less than 50 bergy bits	3
50 or more bergy bits	4
Less than 20 icebergs	5
20 or more icebergs	6
Not determined	9

TABLE 11. THICKNESS OF SEA ICE

No sea ice	0
Less than 4 inches	1
From 4 inches to 1 foot	2
From 1 foot to 3 feet	3
From 3 feet to 6 feet	4
From 6 feet to 8 feet	5
From 8 feet to 10 feet	6
From 10 feet to 12 feet	7
More than 12 feet	8
Not determined	9

TABLE 12. PREVAILING VISIBILITY

Less than 50 yards	0
50 - 200 yards	1
200 yards - 1/4 nautical mile	2
1/4 - 1/2 nautical mile	3
1/2 - 1 nautical mile	4
1 - 2 nautical miles	5
2 - 5 nautical miles	6
5 - 10 nautical miles	7
10 - 25 nautical miles	8
25 or more nautical miles	9
Not determined	X

TABLE 13. LIGHT CONDITIONS

Daylight	1
Twilight	2
Night - moon and aurora	3
Night - moon	4
Night - aurora	5
Night - no moon or aurora	6

SHORE STATION OBSERVERS ICE LOG

STATION Ellsworth	LATITUDE 77°44'S
DISTANCE FROM STATION 1.5 miles	LONGITUDE 41°07'W
DIRECTION FROM STATION North	WATER BODY Weddell Sea
NO. 89043 (Meteorological Index)	ELEVATION 138 feet

	Code	April			May		
Day of Month (LST)		7	17	25	3	10	22
International Index Number							
Time (GCT)		1720	1900	1800	1600	1700	1730
Day of Week (GCT)	A	2	5	6	7	7	5
Operating Location Number	•						
Type of Ice	B	1	1	1	1	1	1
Sky Map	C	8	8	0	0	8	0
Set of Ice Nearest Shore	D						
Concentration, Total	1	5	4	5	4	5	5
Conc., Slush, Brash, Block	1						
Conc., Small and Medium Floe	1						
Conc., Giant Floe and Field	1						
Relief	2	3	3	3	3	3	3
Topography	3	3	4	4	4	4	4
Age, Dominant	4	3	3	3	2	3	3
Age, Secondary	4	2	2	2	3	2	2
Puddling	5	0	0	0	9	0	0
Snow Cover	6	1	1	1	1	1	1
Water Features	7	7	5	8	3	8	8
Orientation	8	8	8	0	8	8	0
Fast Ice	9	4	4	4	3	4	4
Ice of Land Origin	10	5	9	9	9	9	9
Thickness of Sea Ice	11	4	4	4	4	4	4
Prevailing Visibility	12	5	2	2	2	5	2
Light Conditions	13	1	2	2	2	2	6
Sea Water Temperature °F		28°	27°	28°	28°	27°	28°
Ice Temperature °F			- 6°	-15°	- 3°	- 5°	- 4°

Remarks

April 7 — 3 ft. tide crack

17 — Open lead near shore

May 3 — Strong N-NE winds then S; numerous pressure ridges and rafting have developed since last week

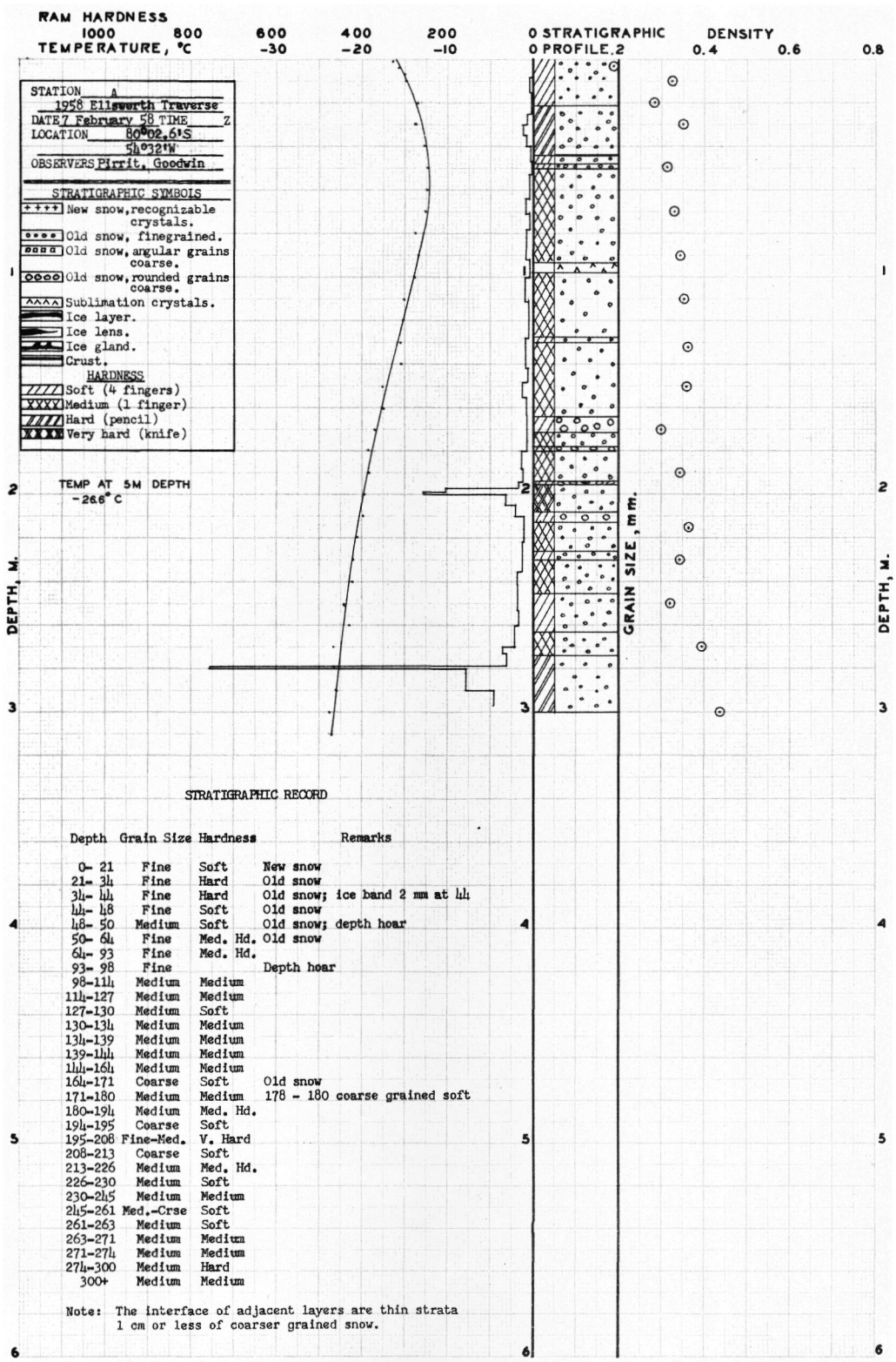
SHORE STATION OBSERVERS ICE LOG

STATION Ellsworth	LATITUDE 77°44'S
DISTANCE FROM STATION 1.5 miles	LONGITUDE 41°07'W
DIRECTION FROM STATION North	WATER BODY Weddell Sea
NO. 89043 (Meteorological Index)	ELEVATION 138 feet

	Code	June			July	August
Day of Month (LST)		6	17	30	23	29
International Index Number						
Time (GCT)		1545	1800	1700	1300	1300
Day of Week (GCT)	A	6	3	2	4	6
Operating Location Number	•					
Type of Ice	B	1	1	1	1	1
Sky Map	C	0	0	0	0	8
Set of Ice Nearest Shore	D	7	7	7	9	7
Concentration, Total	1	5	5	5	5	1
Conc., Slush, Brash, Block	1					
Conc., Small and Medium Floe	1					
Conc., Giant Floe and Field	1					
Relief	2	3	3	3	3	3
Topography	3	4	4	4	4	3 & 4
Age, Dominant	4	3	3	3	3	3
Age, Secondary	4	2	2	2	2	2
Puddling	5	0	0	0	9	0
Snow Cover	6	1	1	1	1	1
Water Features	7	8	8	8	8	8
Orientation	8	8	8	8	8	8
Fast Ice	9	4	4	4	4	4
Ice of Land Origin	10	9	9	9	9	9
Thickness of Sea Ice	11	5	5	5	6	7
Prevailing Visibility	12	0	0	0	0	5
Light Conditions	13	5	6	6	6	1
Sea Water Temperature °F		27°	27°	27°	27°	28°
Ice Temperature °F		- 3°	- 9°	- 2°	-10°	- 4°

Remarks

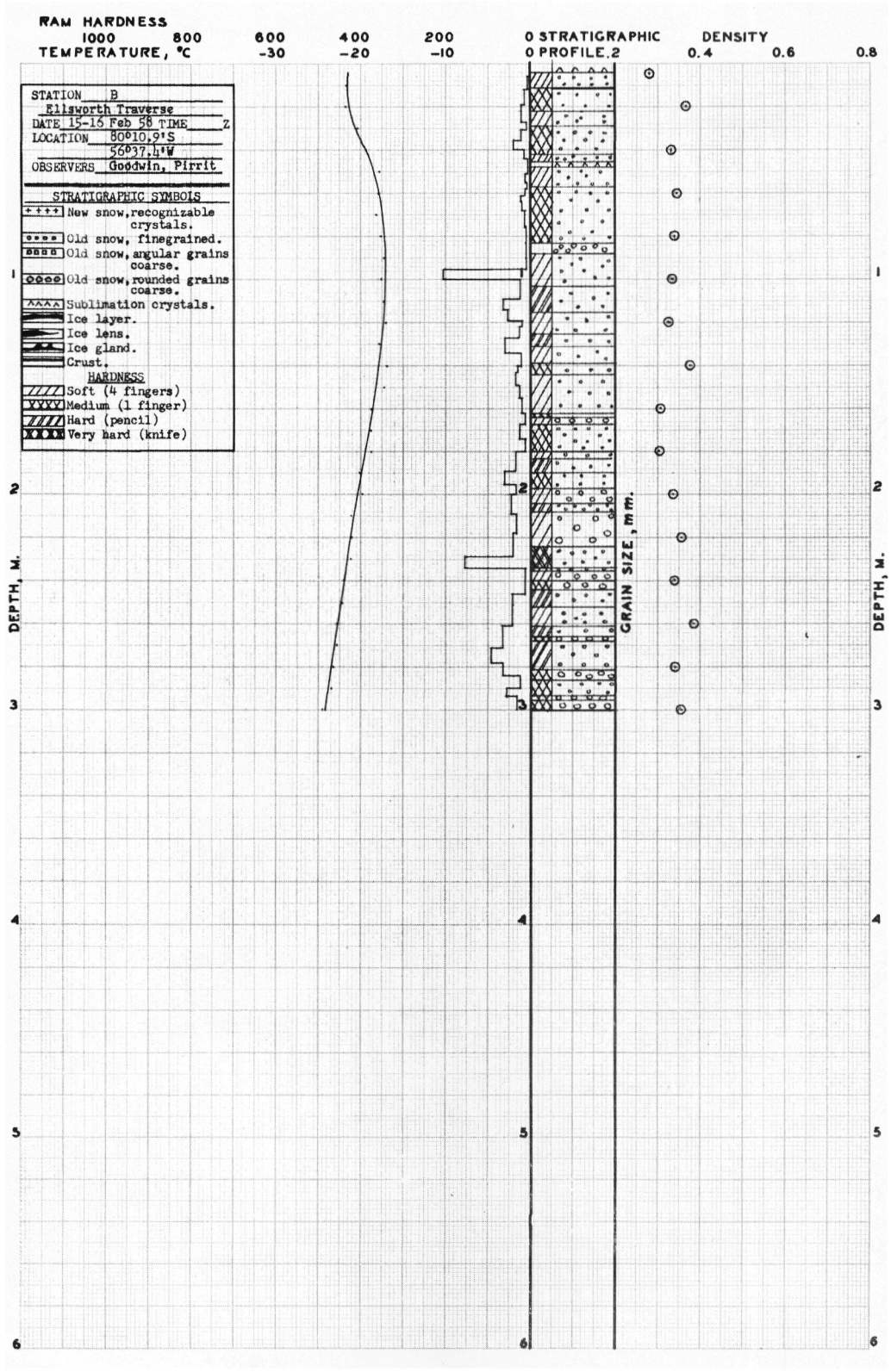
June	17	Ice 84" thick
	30	Ice 97" thick
July	23	Ice 107" thick
August	25	Near middle of month ice broke up and wide shore lead developed; later the lead closed with new pressure ridges and rafting evident



STRATIGRAPHIC RECORD

Depth	Grain Size	Hardness	Remarks
0- 21	Fine	Soft	New snow
21- 34	Fine	Hard	Old snow
34- 44	Fine	Hard	Old snow; ice band 2 mm at 44
44- 48	Fine	Soft	Old snow
48- 50	Medium	Soft	Old snow; depth hoar
50- 64	Fine	Med. Hd.	Old snow
64- 93	Fine	Med. Hd.	
93- 98	Fine		Depth hoar
98-114	Medium	Medium	
114-127	Medium	Medium	
127-130	Medium	Soft	
130-134	Medium	Medium	
134-139	Medium	Medium	
139-144	Medium	Medium	
144-164	Medium	Medium	
164-171	Coarse	Soft	Old snow
171-180	Medium	Medium	178 - 180 coarse grained soft
180-194	Medium	Med. Hd.	
194-195	Coarse	Soft	
195-208	Fine-Med.	V. Hard	
208-213	Coarse	Soft	
213-226	Medium	Med. Hd.	
226-230	Medium	Soft	
230-245	Medium	Medium	
245-261	Med.-Crse	Soft	
261-263	Medium	Soft	
263-271	Medium	Medium	
271-274	Medium	Medium	
274-300	Medium	Hard	
300+	Medium	Medium	

Note: The interface of adjacent layers are thin strata 1 cm or less of coarser grained snow.


RAM HARDNESS
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TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC
0 PROFILE.2
DENSITY
0.4 0.6 0.8
STATION B
Ellsworth Traverse
DATE 15-16 Feb 58 TIME Z
LOCATION 80°10.9'S
56°37.4'W
OBSERVERS Goodwin, Pirrit
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
DEPTH, M.
1
2
3
4
5
6
GRAIN SIZE, mm.

Ellsworth Traverse

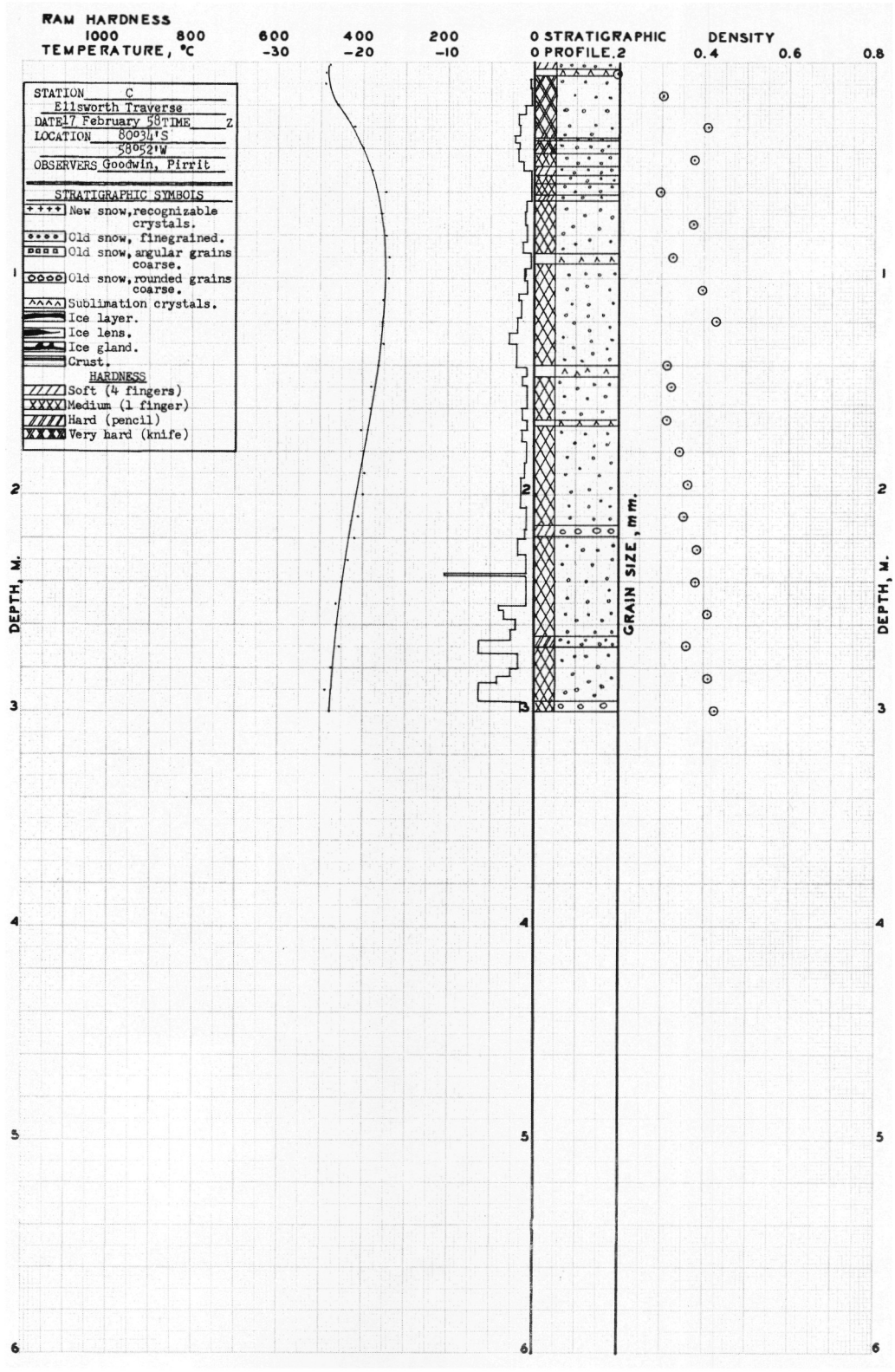
Station B

Date 15 February 1958

Observers Pirrit, Goodwin

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Remarks
Surface		Soft	Crust
1- 4	Coarse	Soft	Surface hoar
4- 11	Fine	Soft	
11		Hard	1 mm ice band
11- 22	Fine	Medium	
22- 29	Fine	Soft	1 mm band
29- 42	Fine	Medium	1 mm band
42- 45	Medium	Soft	
45- 48			Depth hoar
48- 51	Fine	Soft	
51- 57	Fine	Soft	
57- 70	Medium	Soft-Medium	
70- 83	Medium	Soft-Medium	
83- 88	Coarse		**Pronounced constructive metamorphism**
88- 99	Medium	Soft	
99-103	Medium	Soft	
103-115	Fine-Medium	Hard	
115-125	Medium-Coarse	Soft	
125-131	Medium	Hard	
131-139	Medium-Coarse	Soft	
139-142	Medium	Medium	
142-155	Medium-Coarse	Soft	**Constructive metamorphism**
155-162	Medium-Coarse	Soft	
162-164	Medium	Medium	
164-167	Coarse	Soft	**Constructive metamorphism**
167-180	Medium	Medium	
180-183	Fine-Medium	Soft	
183-190	Fine	Hard	
190-197	Medium	Medium	
197-204	Coarse	Soft	**Constructive metamorphism**
204-208	Medium	Hard	
208-224	Coarse	Soft-Medium	
224-234	Fine-Medium	Very Hard	
234-235	Medium	Soft	
235-240	Coarse	Soft	
240-244	Coarse	Medium	
244-252	Medium	Hard	
252-261	Medium	Medium	
261-266	Medium	Hard	
266-268	Coarse	Medium	
268-281	Medium	Hard	
281-286	Coarse	Medium	
286-293	Medium	Medium	
293-295	Coarse	Soft-Medium	
295-300	Coarse	Medium	


RAM HARDNESS
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TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC PROFILE 2
DENSITY
0.4 0.6 0.8
STATION C
Ellsworth Traverse
DATE 17 February 58 TIME Z
LOCATION 80°34'S
58°52'W
OBSERVERS Goodwin, Pirrit
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

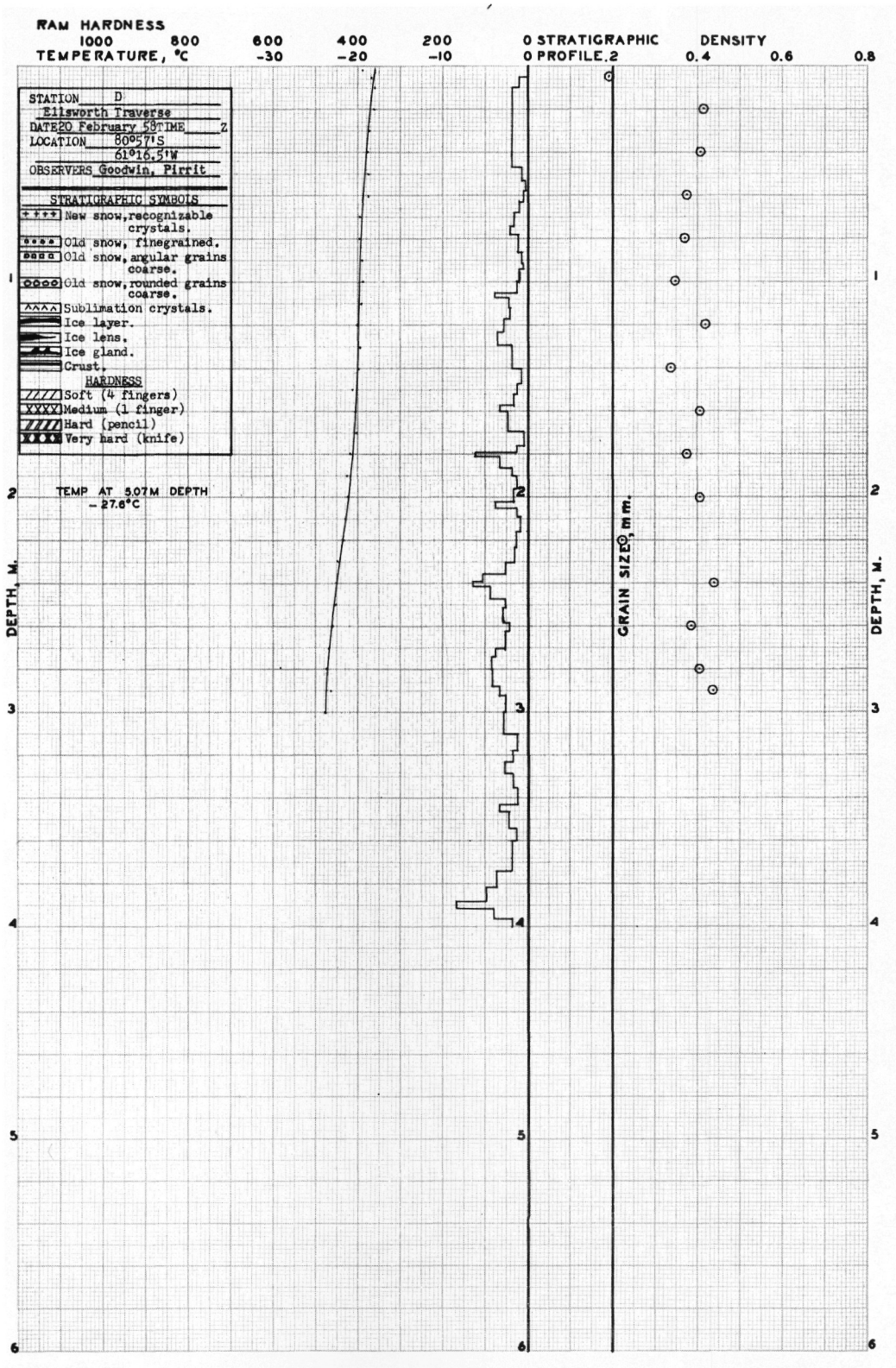
Ellsworth Traverse

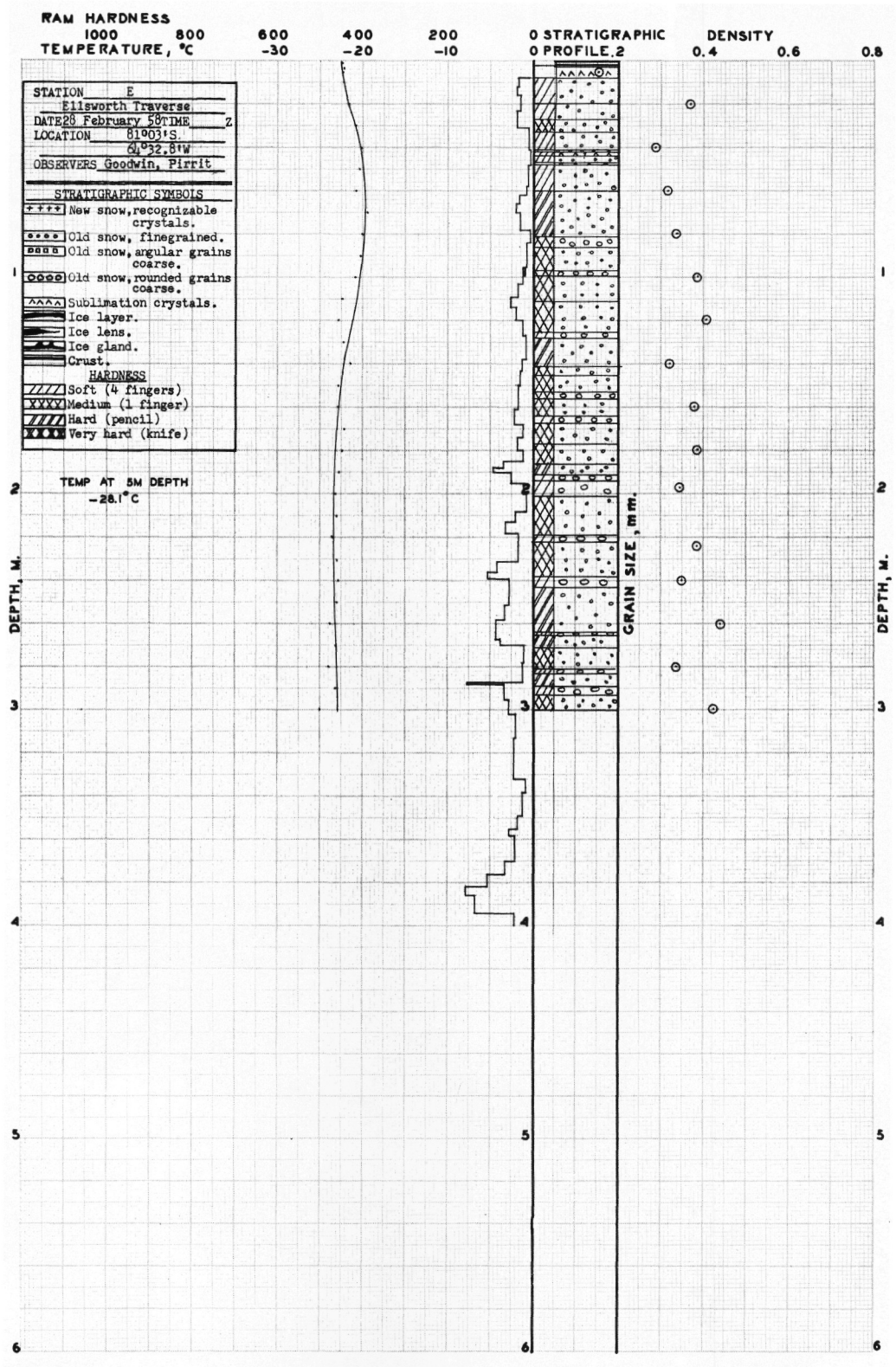
Station C

Date 17 February 1958

Observers Goodwin, Pirrit

Depth cm	Grain Size	Hardness	Remarks
Surface			Thin crust
1- 3	Fine	Soft	Layer of depth hoar at bottom
3- 6			Depth hoar
6- 35	Fine	Very Hard	Homogeneous layer; no banding visible
35- 36	Fine	Soft	
36- 42	Fine	Very Hard	
42- 48	Fine	Medium	
48- 52	Fine	Soft	
52- 56	Fine	Medium	
56- 57	Medium		Loose crystals; constructive metamorphism
57- 61	Medium	Medium	
61- 64	Medium	Soft	
64- 88	Fine-Medium	Medium	
88- 93			Depth hoar
93-113	Medium	Medium-Hard	
113-120	Medium	Medium	
120-140	Medium	Medium	
140-145			Depth hoar
145-152	Medium	Medium	
152-153	Medium	Medium	
153-165	Medium	Medium	Constructive metamorphism
165-168			Depth hoar
168-183	Medium	Medium	
183-195	Medium	Medium	
195-200	Medium	Medium-Soft	
200-214	Medium	Medium	
214-219	Coarse	Soft-Medium	
219-228	Medium	Medium-Hard	
228-235	Coarse	Soft	Constructive metamorphism
235-248	Medium	Medium	
248-265	Medium	Medium-Hard	
265-270	Fine-Medium	Hard	
270-278	Medium	Medium	
278-295	Medium	Medium-Hard	
295-297	Coarse	Medium-Hard	
297-300	Coarse	Medium-Hard	


RAM HARDNESS
1000 800
TEMPERATURE, °C
600 400 200
-30 -20 -10
0 STRATIGRAPHIC
0 PROFILE 2
DENSITY
0.4 0.6 0.8
STATION D
Ellsworth Traverse
DATE 20 February 58 TIME Z
LOCATION 80°57'S
61°16.5'W
OBSERVERS Goodwin, Pirrit
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 5.07M DEPTH
-27.6°C
GRAIN SIZE, mm.
DEPTH, M.
1
2
3
4
5
6


RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC
0 PROFILE 2
DENSITY
0.4 0.6 0.8
STATION E
Ellsworth Traverse
DATE 28 February 58 TIME Z
LOCATION 81°03'S.
64°32.8'W
OBSERVERS Goodwin, Pirrit
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 5M DEPTH
-28.1°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Ellsworth Traverse

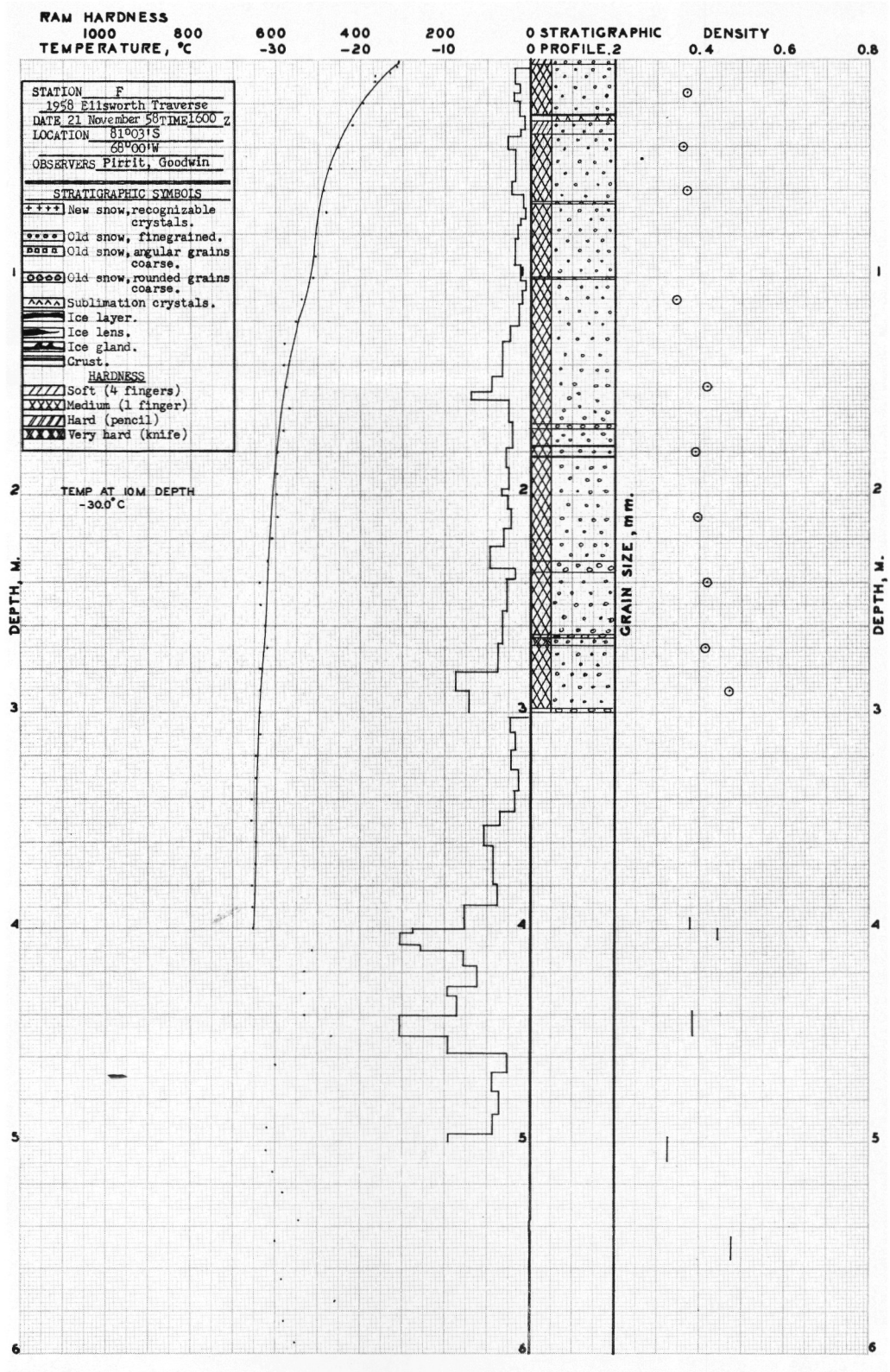
Station E

Date 28 February 1958

Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Remarks
Surf.- 2.5			Crust
2.5- 8			Depth hoar
8 - 20	Fine	Soft-Medium	
20 - 27	Fine	Soft	
27 - 33	Fine	Medium	
33 - 41	Medium	Soft	Constructive metamorphism
41 - 42	Fine	Soft	
42 - 44			Depth hoar?
44 - 47	Fine	Soft	
47 - 48			Depth hoar?
48 - 60	Medium	Soft	
60 - 81	Fine	Hard	
81 - 86	Coarse	Soft	Old depth hoar; constructive metamorphism
86 - 97	Fine	Medium	
97 - 99	Coarse	Soft	Constructive metamorphism
99 -111	Fine	Medium	
111 -117	Medium	Medium	
117 -125	Medium	Medium	
125 -128	Coarse	Soft	Constructive metamorphism
128 -141	Medium	Hard	
141 -145	Medium	Soft	
145 -153	Medium	Medium	
153 -156	Coarse	Soft	Constructive metamorphism
156 -164	Medium	Medium	
164 -167	Coarse	Soft	Constructive metamorphism
167 -177	Fine	Medium	
177 -186	Medium	Medium	
186 -191	Fine	Hard	
191 -194	Coarse	Soft	Constructive metamorphism
194 -199	Coarse	Soft	
199 -201	Coarse	Soft	
201 -219	Fine	Medium-Hard	
219 -222	Coarse	Soft	
222 -238	Medium	Medium	
238 -243	Coarse	Soft	Constructive metamorphism
243 -264	Fine	Hard	
264 -265	Coarse	Soft	Constructive metamorphism
265 -271	Fine-Medium	Hard	
271 -276	Medium	Soft-Medium	
276 -281	Medium	Medium	
281 -283	Coarse	Soft	Constructive metamorphism
283 -289	Fine	Hard	
289 -293	Coarse	Soft	
293 -300	Medium-Coarse	Medium	

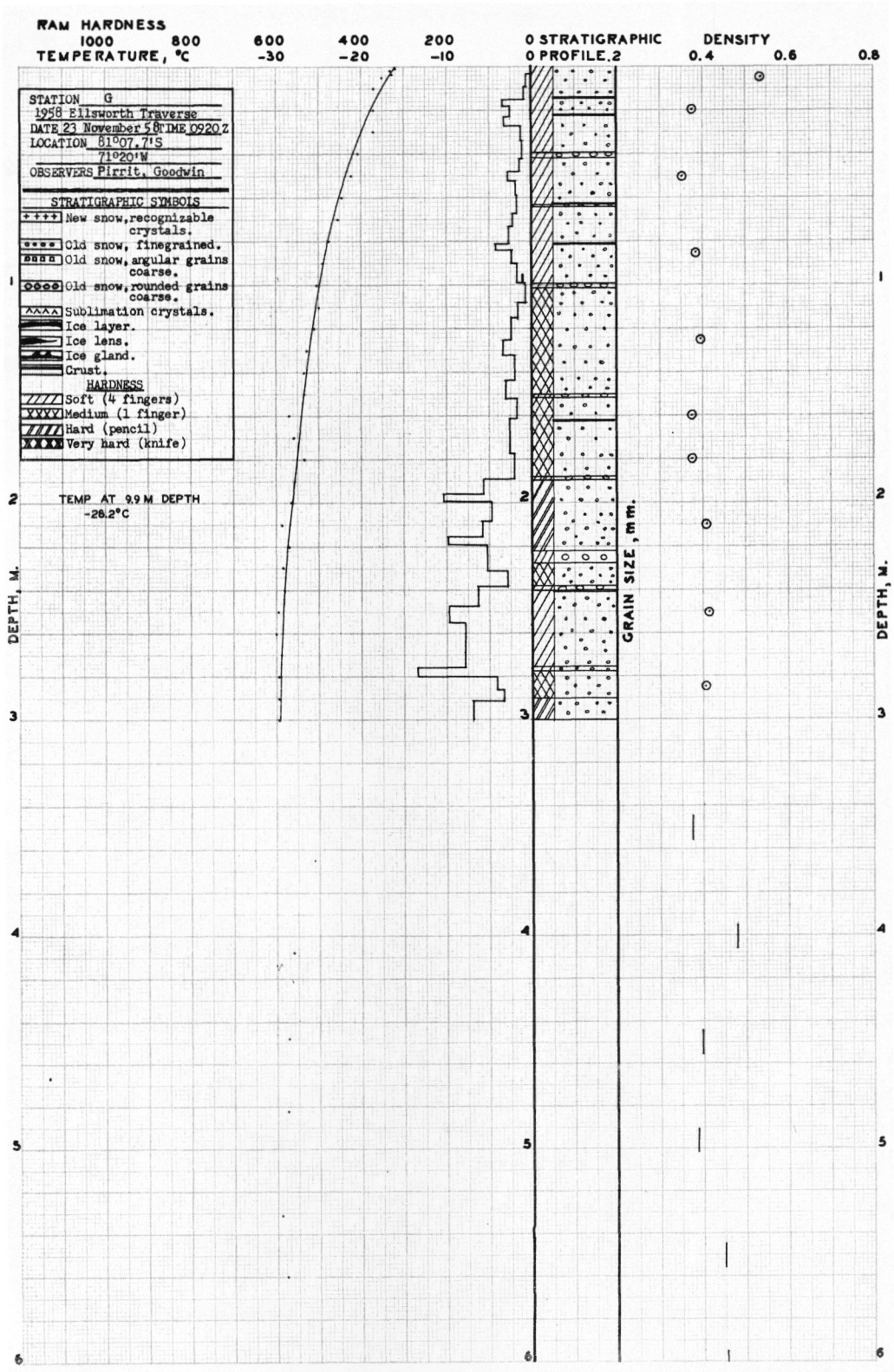

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC PROFILE 2
DENSITY
0.4 0.6 0.8
STATION F
1958 Ellsworth Traverse
DATE 21 November 58 TIME 1600 Z
LOCATION 81°03'S
68°00'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 10M DEPTH
-30.0°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station F
Date 21 November 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 2	M	S	L	Surface snow
2- 5	F	M	L	
5- 20	F	M	L	
20- 25	F	M	L	1 mm crust at base
25- 28				Depth hoar
28- 34	F	S	L	
34- 65	M	M	M	
65- 66				Depth hoar
66- 80	M	S-M	M	
80-100	M	M	F	
100-105	C	S	L	**Constructive metamorphism**
105-167	M	M	F	
167-169	C	S	L	**Constructive metamorphism**
169-230	M	M	F	At 177 and 221 coarse grained crust 4 mm thick
230-235	C	M	M-L	**Constructive metamorphism**
235-254	M	M	F	
254-255	C	M	M	**Constructive metamorphism**
255-259	F	VH	VF	
259-298	M	M	F	
298-300	C			**Constructive metamorphism**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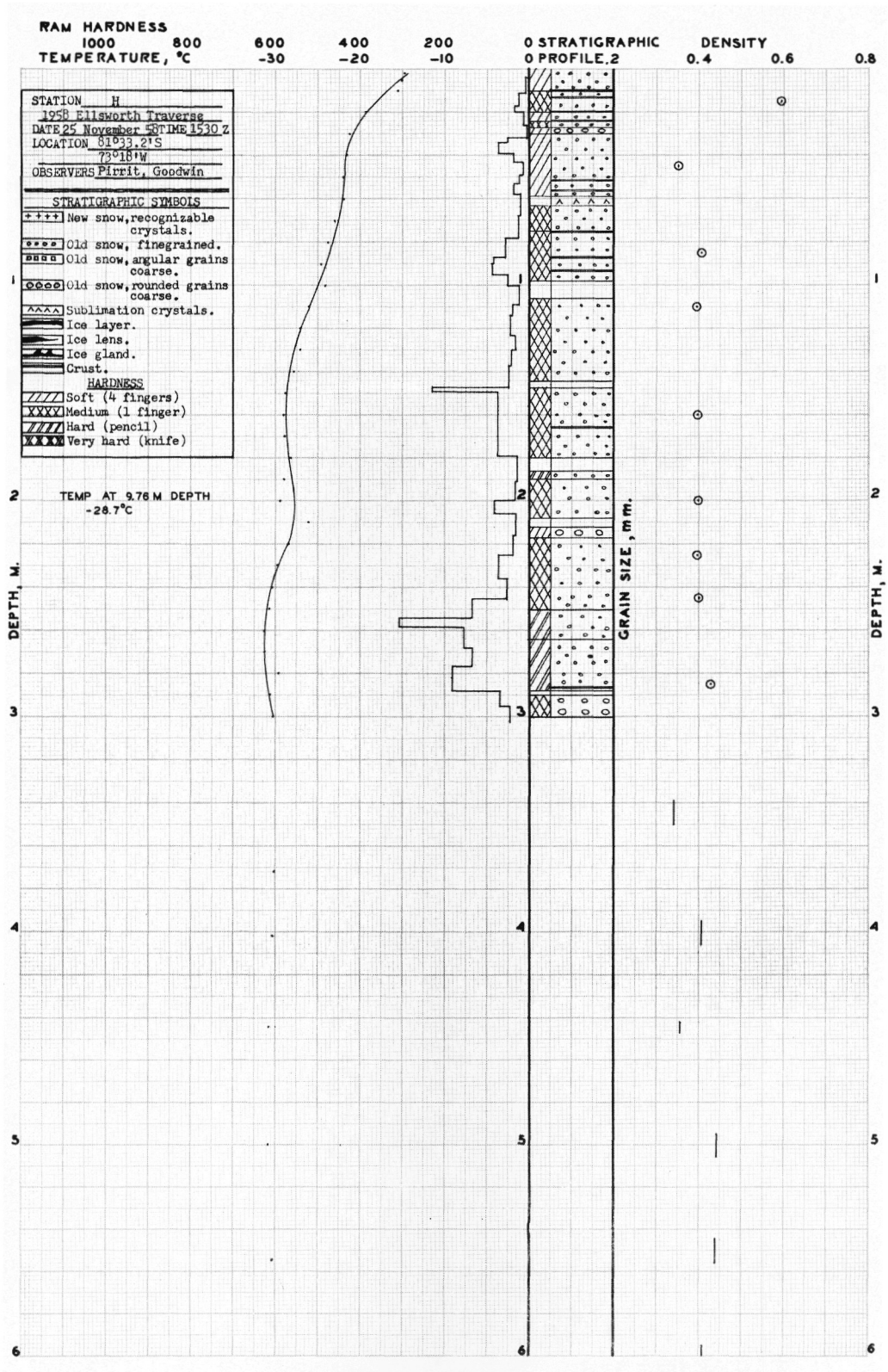
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION G
1958 Ellsworth Traverse
DATE 23 November 58 TIME 0920 Z
LOCATION 81°07.7'S
71°20'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.9 M DEPTH
-28.2°C
DEPTH, M.
GRAIN SIZE, mm.
DEPTH, M.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station G
Date 23 November 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0 - 2.5	F-M	S	L	
2.5- 29	F	S	L	At 14 and 22 crusts 2 mm thick
29 - 31	M-C	S	L	**Constructive metamorphism**
31 - 63	F	S	L	Crust 2 mm at 43
63 - 64	C	S	L	**Constructive metamorphism**
64 - 99	F	S-M	M	Crust 1 mm at 81
99 -101	C	S	L	**Constructive metamorphism**
101 -150	F	M	M	
150 -151	C	S	L	**Constructive metamorphism**
151 -188	M	M	L	Prominent 2 mm crust at 162
188 -189	C	S	L	Varies 1 - 4 cm thick **constructive metamorphism**
189 -222	F	H	F	
222 -227	C	S	L	**Constructive metamorphism**
227 -238	M	M	L	
238 -240	C	S	L	**Constructive metamorphism**
240				Crust 2 mm
240 -275	F-M	H	F	
275 -277	M	S	L	
277 -290	M	M	M	
290 -300	F-M	H	F	

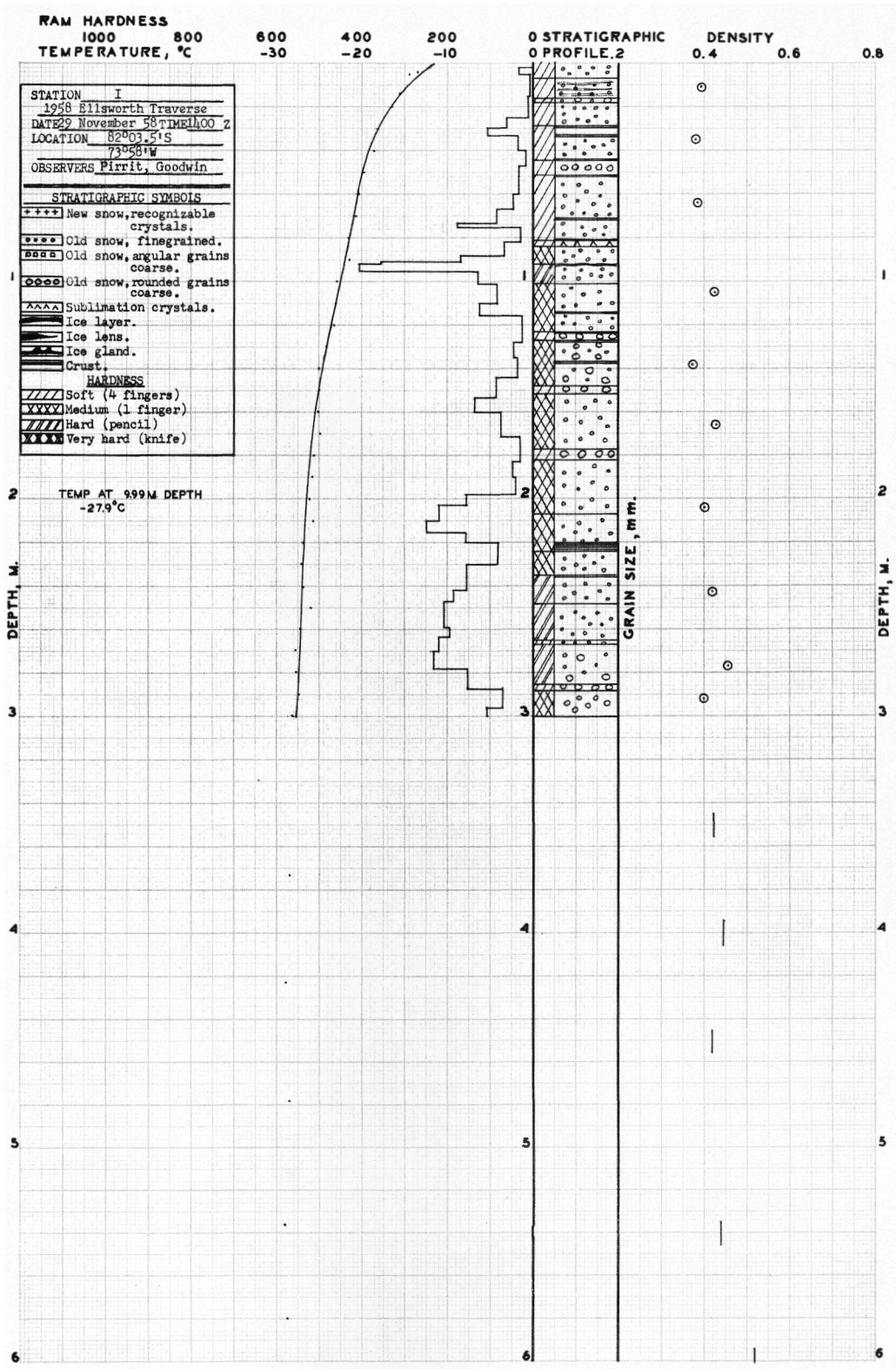

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC PROFILE 2
DENSITY 0.4 0.6 0.8
STATION H
195B Ellsworth Traverse
DATE 25 November 58 TIME 1530 Z
LOCATION 81°33.2'S
73°18'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.76 M DEPTH
-28.7°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station H
Date 25 November 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 2	F	S	L	
2- 27	F	Variable		2 - 10 soft, 10 - 20 medium, 20 - 24 soft, 24 - 27 medium; crusts at 10, 13, 20 and 24
27- 30	C	S	L	Constructive metamorphism
30- 59	M	S	L	Crusts at 51, 52, 56
59- 63	C			Depth hoar
63- 75	M	S	L	Crust at 75; annual layer 63 - 98?
75- 98	M	M	M	Crusts at 87 and 93
98-104				Constructive metamorphism
104-144	M	M	M	
144-147				Constructive metamorphism
147-180	M	M	F	Crust at 165
180-186				Constructive metamorphism
186-190	M	H	F	
190-208	M	M	M	
208-212				Annual layer 208 - 258?
212-215	M-C	S	M	
215-217	C	S	L	
217-250	M	M	F	
250-258	F-M	H	F	
258-259				Constructive metamorphism
259-264	F-M	H	F	Wavy layer, varying thickness
264-288	M	H	F	Crust at 286
288-290				Constructive metamorphism
290-300	C	M	M	

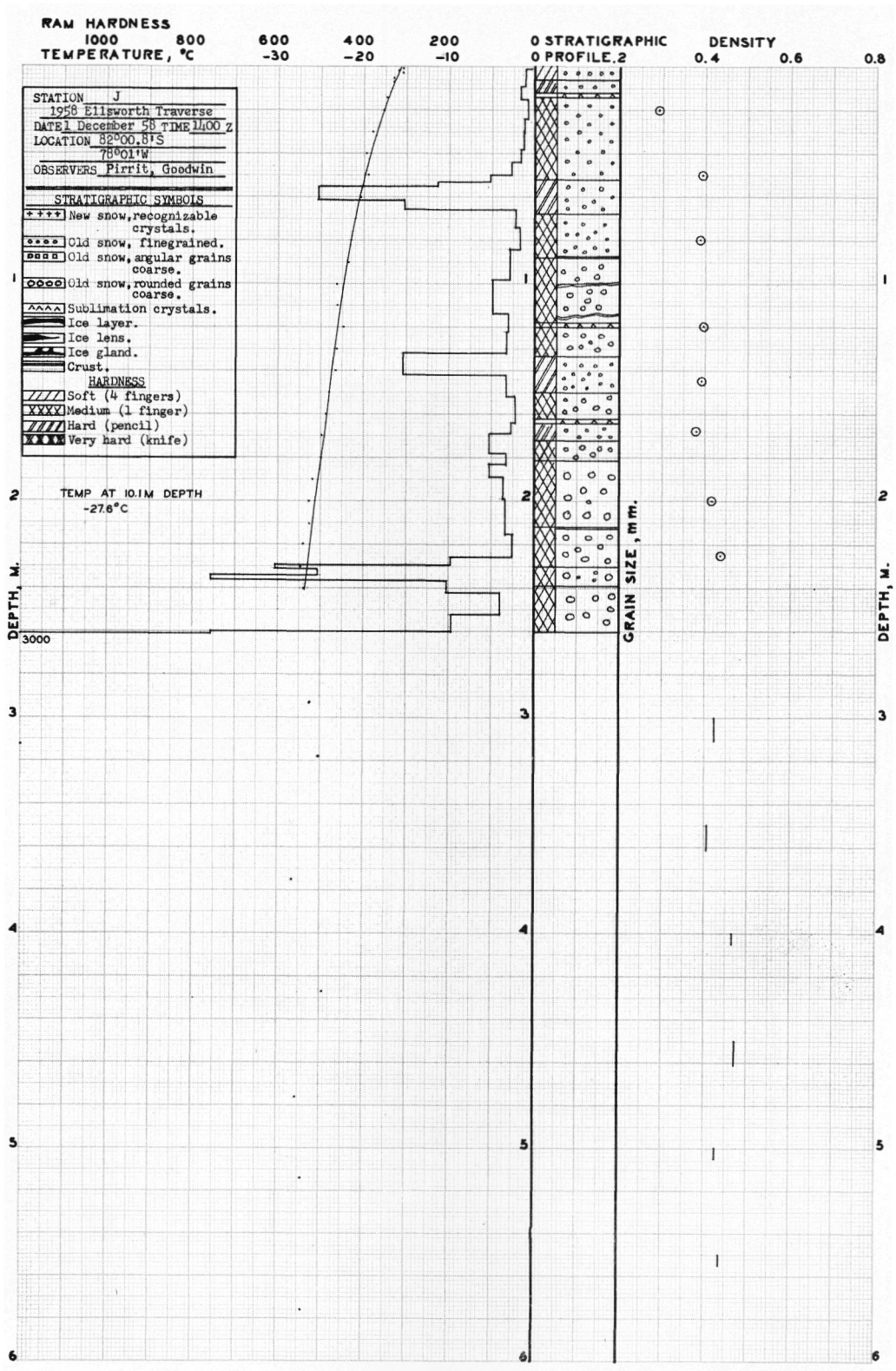

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC 0 PROFILE 2
DENSITY 0.4 0.6 0.8
STATION I
1958 Ellsworth Traverse
DATE 29 November 58 TIME 1400 Z
LOCATION 82°03.5'S 73°58'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.99M DEPTH -27.9°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station I
Date 29 November 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 7	F	S	L	
7- 16	F	S	L	Irregular crust (numerous)
16- 18	F-M	S	L	
18- 29	F	S	L	
29				Crust
29- 44	F	S-M	L	Crust at 33
44				Crust
44- 51	M	S	L	Constructive metamorphism
51				2 mm crust
51- 81	F	S-M	M	Crust at 71
81				Ice band 5 mm thick
81- 84	C	S	L	Depth hoar
84- 92	F	M	M	
92-101	F	H	F	Wavy crust (top of drift)
101-123	F	M	M	Crust at 114
123-127	C	S	L	Crust above and below a layer of constructive metamorphism
127-148	F-M	M	M	Crust at 137
148-151	C	S	L	Constructive metamorphism
151-177	F	M	M	
177-182	C	S	L	Variable thickness
182-207	F	M	M	
207-224	F	M-H	M-F	Crust at 221, 222, 224, old drifts
224-237		M	M	
237				Crust
237-248	F-M	H	F	
248-265	F	H	F	
265-267	M	S	L	Possible constructive metamorphism underlain by thin crust
267-285	M	H	F	
285-288	C	S	L	Constructive metamorphism; thin crust
288-300	M	M	M	
300-302	C	S	L	Constructive metamorphism

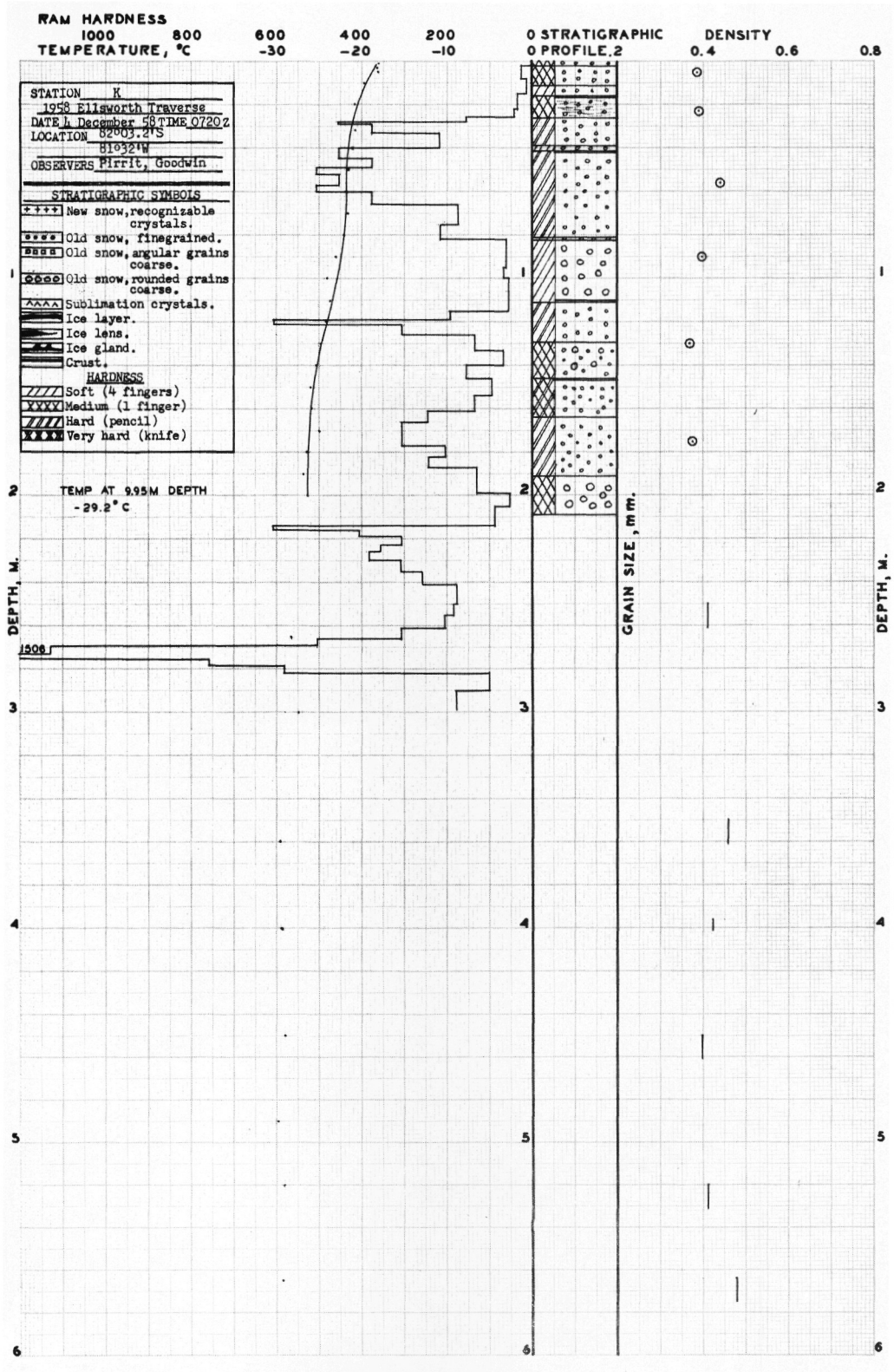

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC PROFILE, 2
DENSITY 0.4 0.6 0.8
STATION J
1958 Ellsworth Traverse
DATE 1 December 58 TIME 1400 Z
LOCATION 82°00.8'S 78°01'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 10.1M DEPTH
-27.6°C
3000
DEPTH, M.
GRAIN SIZE, mm.
DEPTH, M.

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station J
Date 1 December 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 6	F	S	L	
6- 12	F	H	F	
12- 14				Depth hoar
14- 52	F	M	M	
52- 68	F	H	F	
68- 88	F	M	M	3 - 5 mm ice band at base
88-118	M	M	M	2 wavy crusts at 100 and 115
118-120	M	M	L	Old depth hoar?
120-133	M	M	M	
133-150	F	H	F	Variable thickness
150-162	M	M	M	
162-164				Depth hoar?
164-172	F	H	F	
172-181				Constructive metamorphism overlain by thin crust
181-212	M	M	F	
212				Thin crust
212-230	M	M	F	
230-239	F-M	M	F	
239-260	M	M	M	

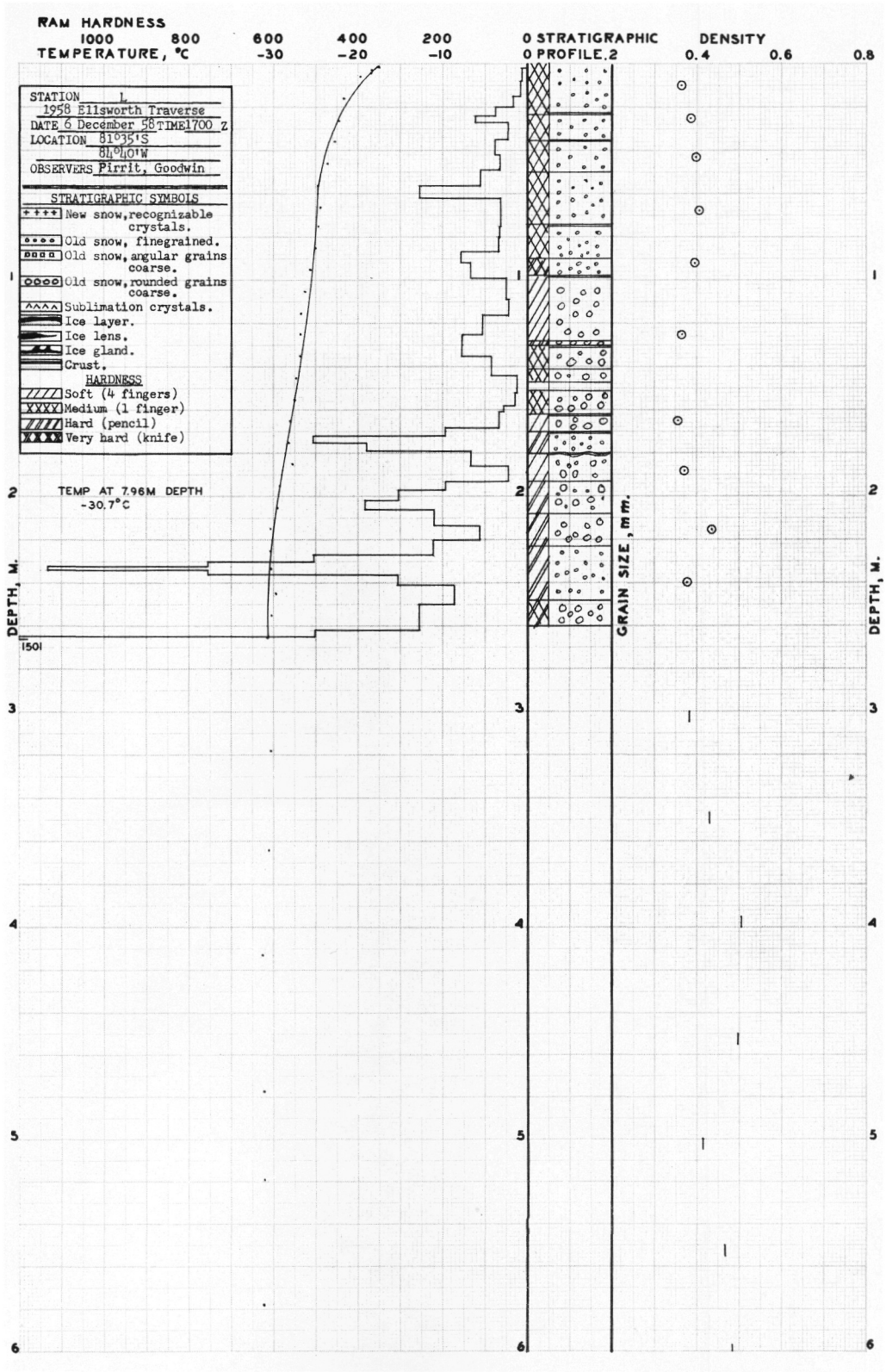

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION K
1958 Ellsworth Traverse
DATE 4 December 58 TIME 0720Z
LOCATION 82°03.2'S
81°32'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.95M DEPTH
-29.2° C
1506
DEPTH, M.
GRAIN SIZE, mm.
DEPTH, M.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station K
Date 4 December 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 2	F	M	M	
2- 11	F	M	M	
11- 16	F	S	L	Underlain by 5 mm crust
16- 26	F	M	M	Layered appearance (wind drifted)
26- 39	F	H	F	
39- 41	F	S	L	Varies from 2 - 15 cm underlain by crust
41- 81	F	H	F	
81- 82	M	S	L	**Possible annual layer**
82-111	M	S	M	Underlain by two thin 2 mm crust 1/2 cm apart
111-129	F	H	F	
129-146	F-M	M	L	Underlain by thin crust
146-164	F	M-H	M	
164-191	F	H	F	
191-209	M	M	M	

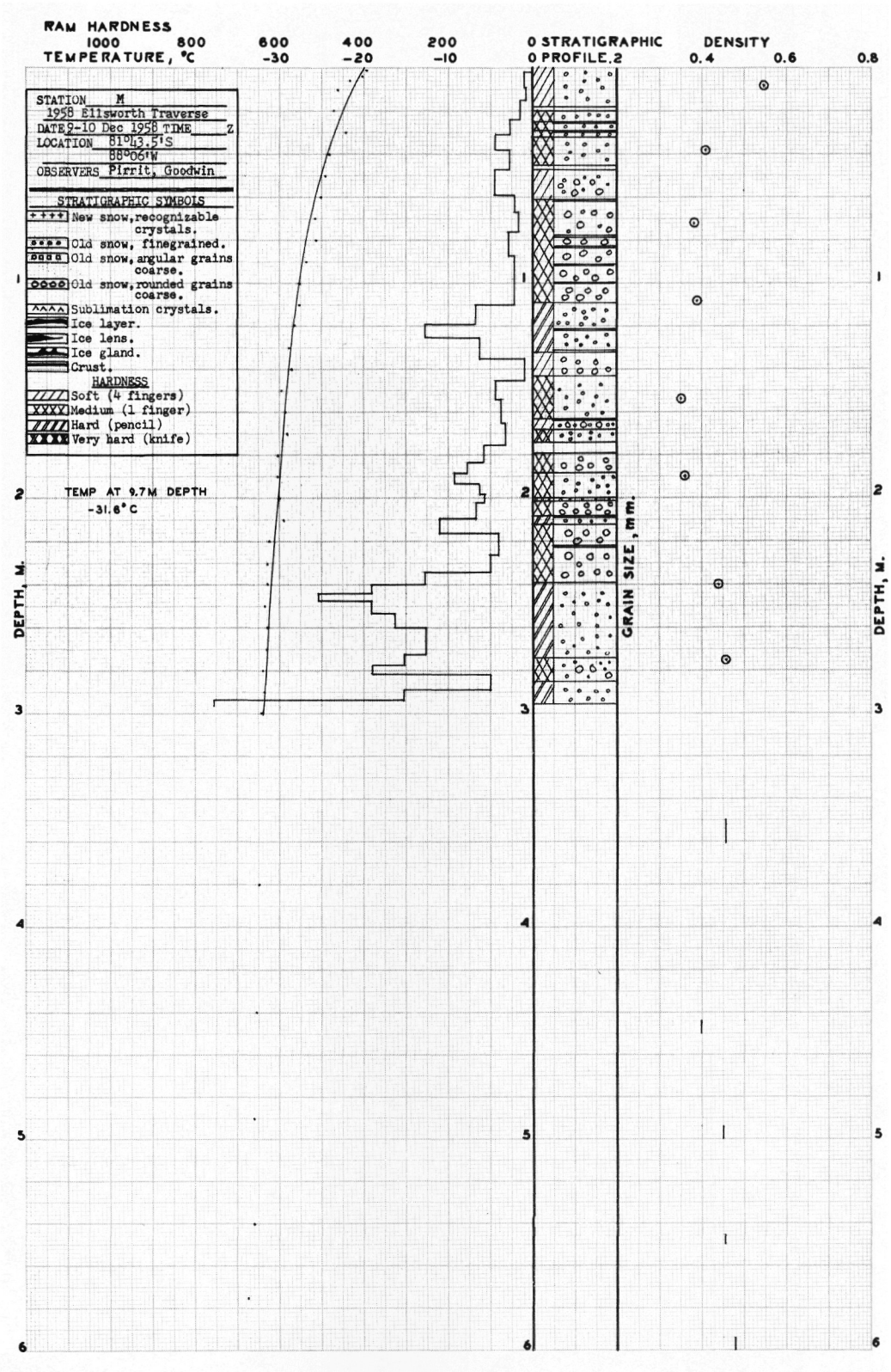

RAM HARDNESS
1000 800
TEMPERATURE, °C
600 400 200
-30 -20 -10
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION 1
1958 Ellsworth Traverse
DATE 6 December 58 TIME 1700 Z
LOCATION 81°35'S
84°40'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 7.96M DEPTH
-30.7°C
DEPTH, M.
GRAIN SIZE, mm.
1 2 3 4 5 6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station L
Date 6 December 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 23	F	M	L	
23				Ice band at 23, 3 mm thick
23- 35	F	M	L	
35				Ice band at 35, 2 mm thick
35- 50	F	M	M	
50- 74	F	M	M	
74				Thin crust at 74
74- 90	F	M	M	
90- 98	F	M-H	F	
98				Crust
98-128	M	S	M	
128-130	M	H	F	
130				Thin crust 2 mm
130-141	M	M	M	
141-147	M	M	M	
147-151				Constructive metamorphism
151-162	M	M	M	
162				Thin crust at 162
162-170	M	S	L	
170				Thin crust
170-180	F	H	F	
180				Wavy crust at 180, 3 mm thick
180-193	M	S	M	
193-208	F-M	H	F	
208-223	M	H	F	
223-248	F	H	F	
248-260	M	M-H	F	

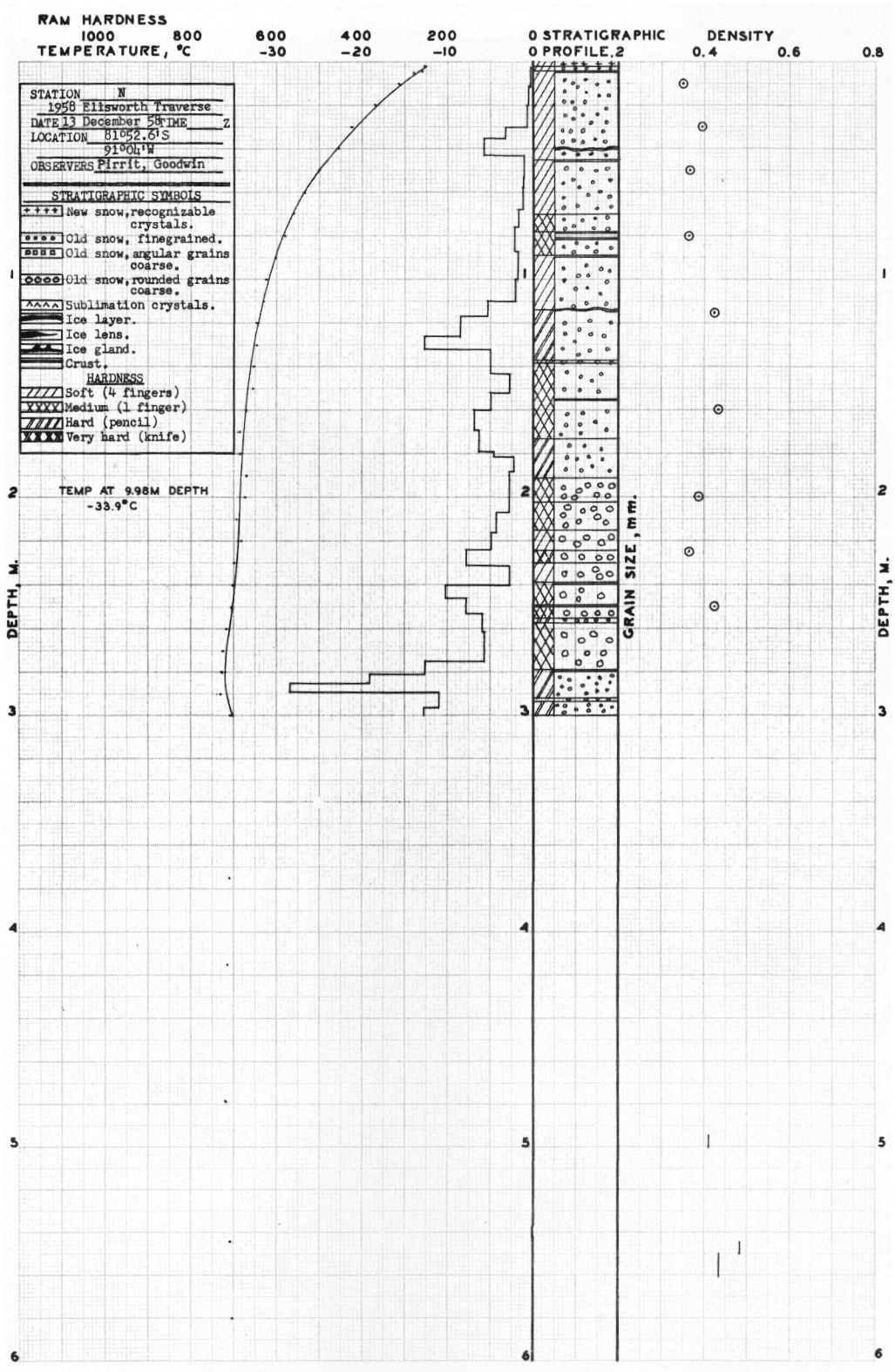

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC
0 PROFILE.2
DENSITY
0.4 0.6 0.8
STATION M
1958 Ellsworth Traverse
DATE 9-10 Dec 1958 TIME Z
LOCATION 81°43.5'S
88°06'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.7M DEPTH
-31.8°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station M
Date 9 December 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 18	F	S	L	
18- 20				Constructive metamorphism
20- 25	F	M	L	Underlain by thin crust
25- 29	F	M	M	Underlain by thin crust
29- 32	F	M	M	
32- 45	F	M	M	
45- 47				Constructive metamorphism
47- 61	F-M	S	L	Underlain by 2 mm crust
61-109	M	M	M	Crusts at 78, 83, 91, 100
109-132	F	H	F	Crusts at 121, 131
132-143	M	S	L	
143-163	F	M	M	Underlain by ice band 5 mm thick
163-168	M-C	S	L	Possible constructive metamorphism
168-174	F	M-H	M	
174-179				Constructive metamorphism; harder band at center
179-188	M	M	M	
188-200	F	M	M	Underlain by crust
200-201	F	H	F	
201-208	M	M	M	Underlain by thin crust
208-212	F	H	F	
212-239	M	M	M	Crust at 222
239-274	F	H	F	
274-285	M-C	M	M	
285-295+	F	H	F	

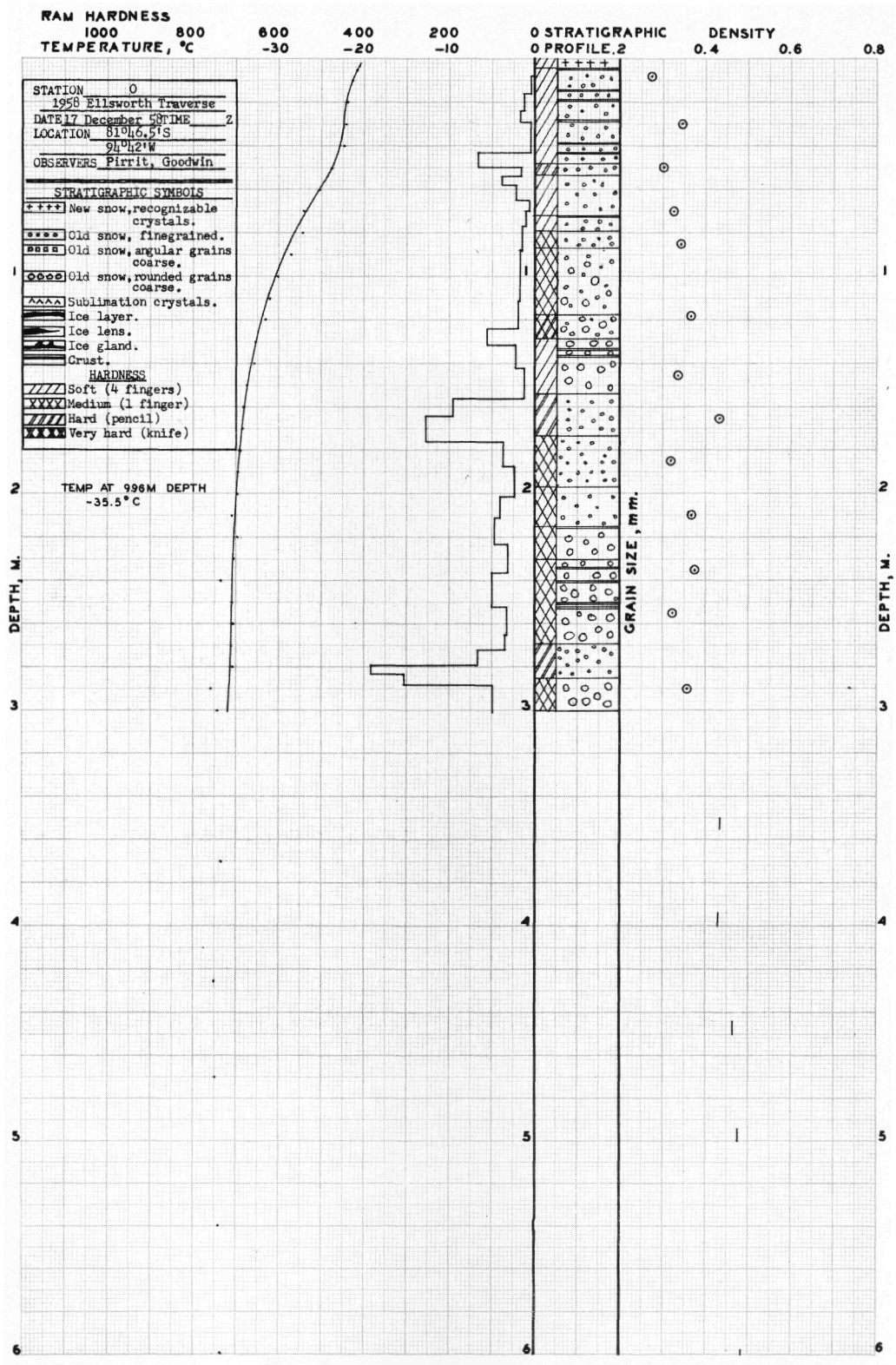

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC PROFILE, 2
DENSITY 0.4 0.6 0.8
STATION N
1958 Ellsworth Traverse
DATE 13 December 58 TIME Z
LOCATION 81°52.6'S 91°00.1'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.98M DEPTH -38.9°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Station
Station N
Date 13 December 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 2	F	S	L	New snow
2- 4	F	S	L	Thin crust at 4 cm
4- 45	F	S	L	Wavy crust at 40, well stratified by wind
45- 46				1 cm layer very soft
46- 70	F	S	L	
70- 78	F	M	L	Underlain by a thin crust
78- 89	F	M	L	Thin crust at 81
89				Thin crust
89-114	F	S	L	
114-137	F	H	F	Upper boundary wavy
137-138	M	S	L	
138-173	F	M	M	At 155 slightly coarser band
173-191	F	H	F	
191-202	M	M	M	Crust at 196
202-215	M	M	M	
215-224	M	S	L	
224-230	F	M-H	F	
230-239	M	S	M	Underlain by thin crust
239-249	F	M	M	Underlain by thin crust
249-250				Constructive metamorphism; underlain by thin crust
250-255	M	M	M	
255-257	F	H	F	
257-279	M	M	M	Underlain by thin crust
279-292	F	H	F	
292-293	M	S-M	L	
293-300	F	H	F	

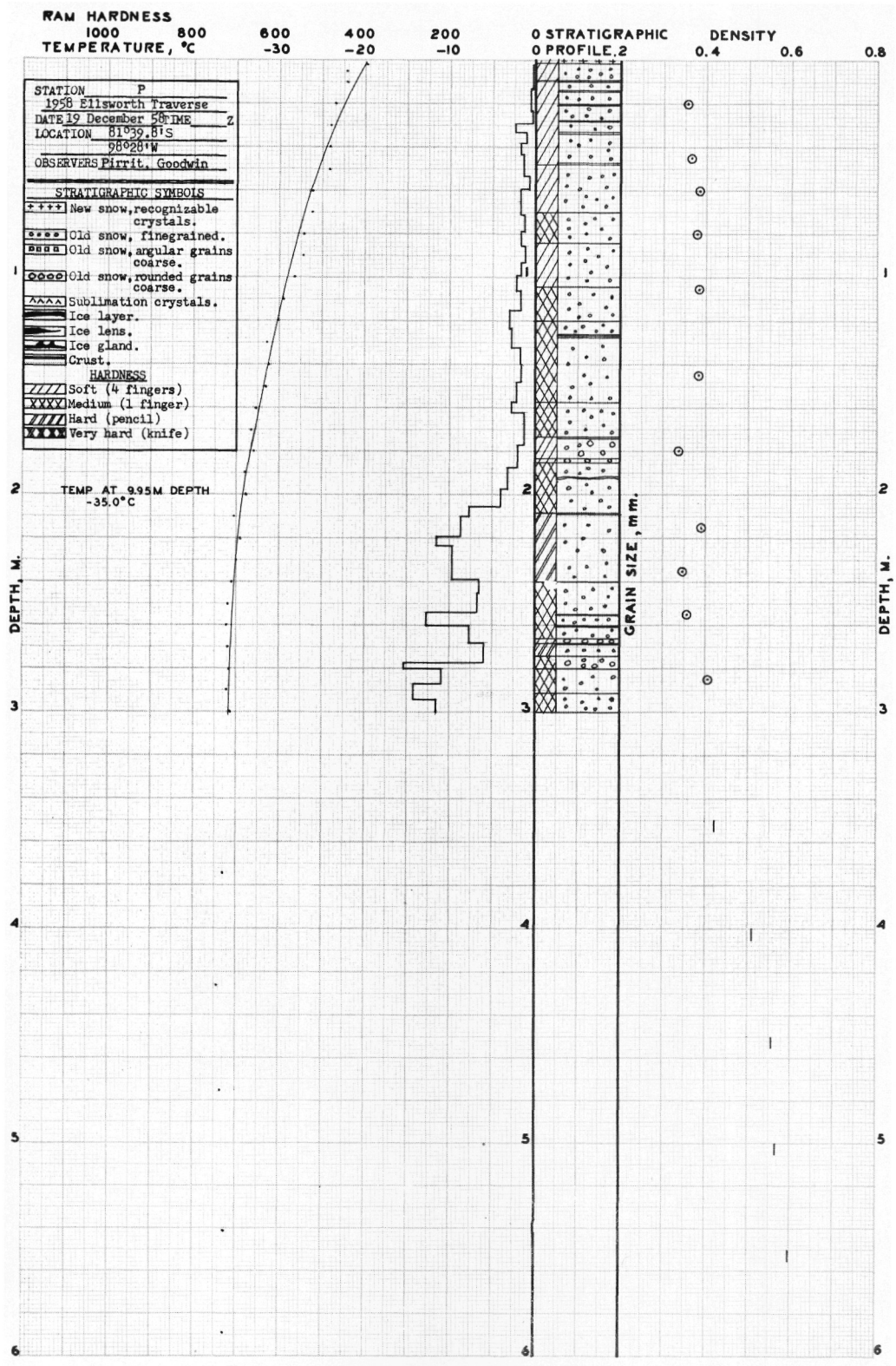

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC PROFILE, 2
DENSITY 0.4 0.6 0.8
STATION 0
1958 Ellsworth Traverse
DATE 17 December 58 TIME Z
LOCATION 81°46.5'S
94°42'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 996M DEPTH
-35.5°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station 0
Date 17 December 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 4	F	S		New snow
4- 48	F	S	L	Crusts at 4, 15, 19, 28; alternate layers hard and soft; ice band 39, 43
48- 53	F	H	F	1 cm soft 52 - 53
53- 72	F	S	L	Underlain by crust
72- 79	F	S	L	
79- 87	F	M	M	
87-117	F-M	M	M	
117-128	F-M	M-H	M-F	
128-154	M	S	L	Underlain by thin crust; soft layers: 133 - 134 and 136 - 137
154-173	F	H	F	
173-197	F	M	M	189 - 197 soft and loose
197-215	F	M	M	Underlain by thin crust
215-230	M	M	M	
230-269	M	M	M	Crust at 234, 240, 250, 252
269-285	F	H	F	
285-300+	M	M	M	

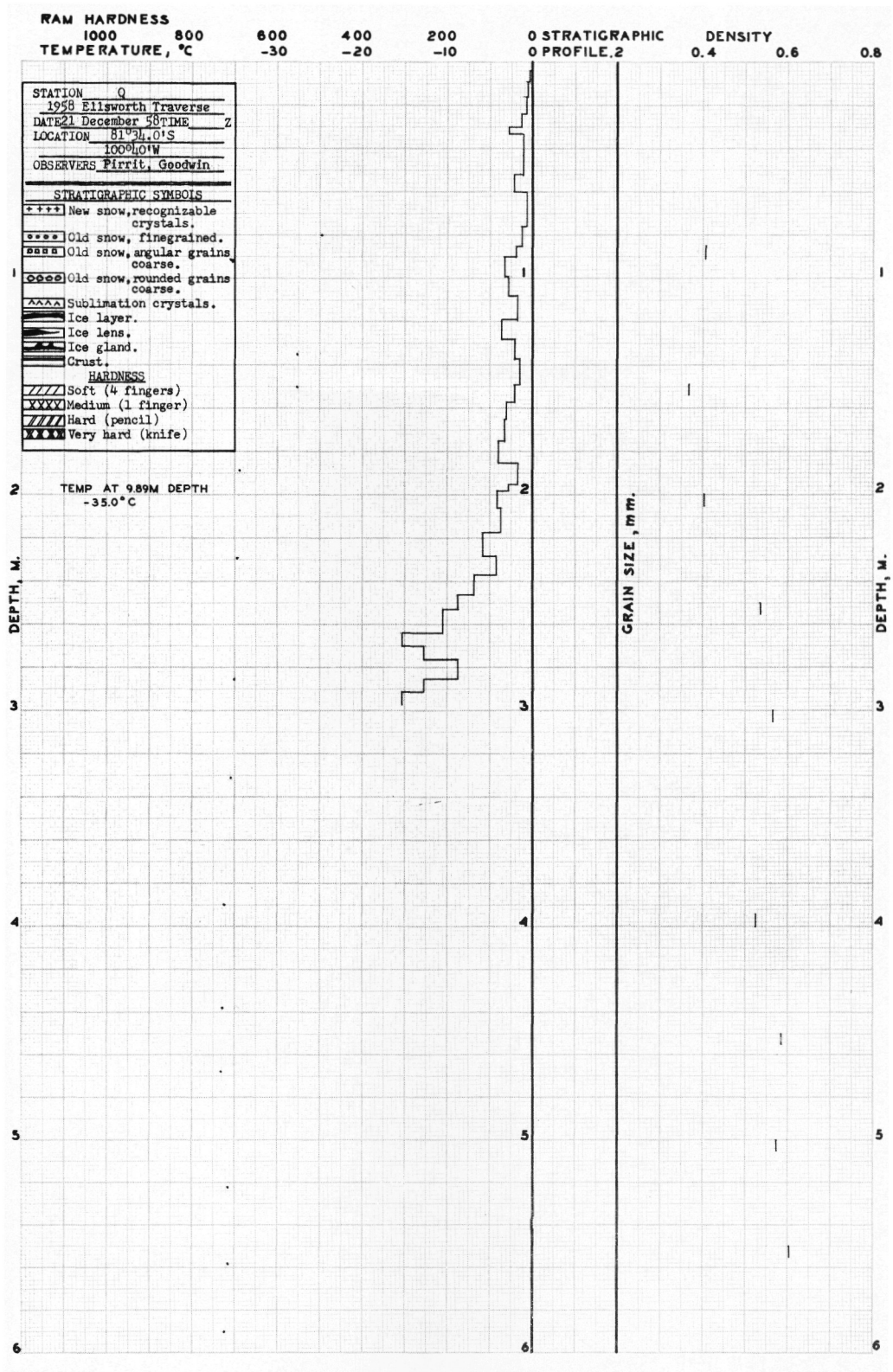

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC PROFILE 2
DENSITY 0.4 0.6 0.8
STATION P
1958 Ellsworth Traverse
DATE 19 December 58 TIME Z
LOCATION 81°39.8'S 98°28'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.95M DEPTH -35.0°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

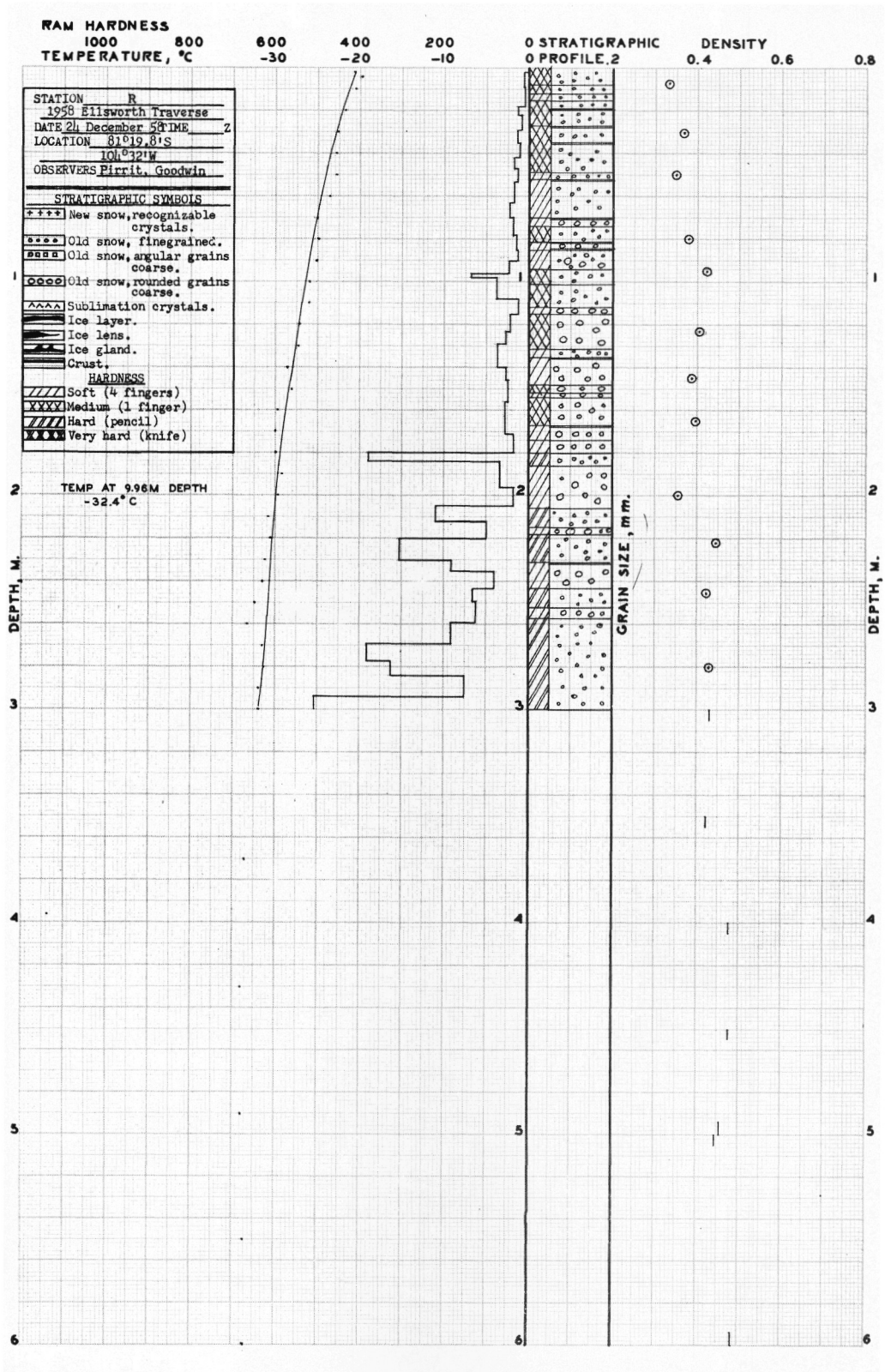
Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station P
Date 19 December 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 1	F	S	L	New snow
1- 9	F	S	L	
9				Thin crust at 9
9- 47	F	S	L	Thin crust at 14, 20, 33; 28 - 33 medium hard layer
47- 48	M	S	L	
48- 70	F	S	L	Crust at 60 and 70
70- 84	F	M	L-M	
84-104	F	S	L	
104-120	F	M	M	
120-157	F	M	M	Crust at 126 and 127
157				Crust
157-173	F	M	M	
173-183	M	S	L	Crust at 183
183-185	M	S	L	
185-218	F	M	F	Wavy crust at 192
218				Crust
218-240	F	H	F	
240-266	F	M	M	Hard layer 255 - 260
266-268	M	S	L	Crust at 267
268-276	F	H	F	
276-280	M	M	M	
280-291	F	M	F	
291-300	F	M	F	


RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC PROFILE
DENSITY
0 0.2 0.4 0.6 0.8
STATION Q
1958 Ellsworth Traverse
DATE 21 December 58 TIME Z
LOCATION 81°34.0'S
100°40'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.89M DEPTH
-35.0°C
GRAIN SIZE, mm.
DEPTH, M.
DEPTH, M.
1
2
3
4
5
6

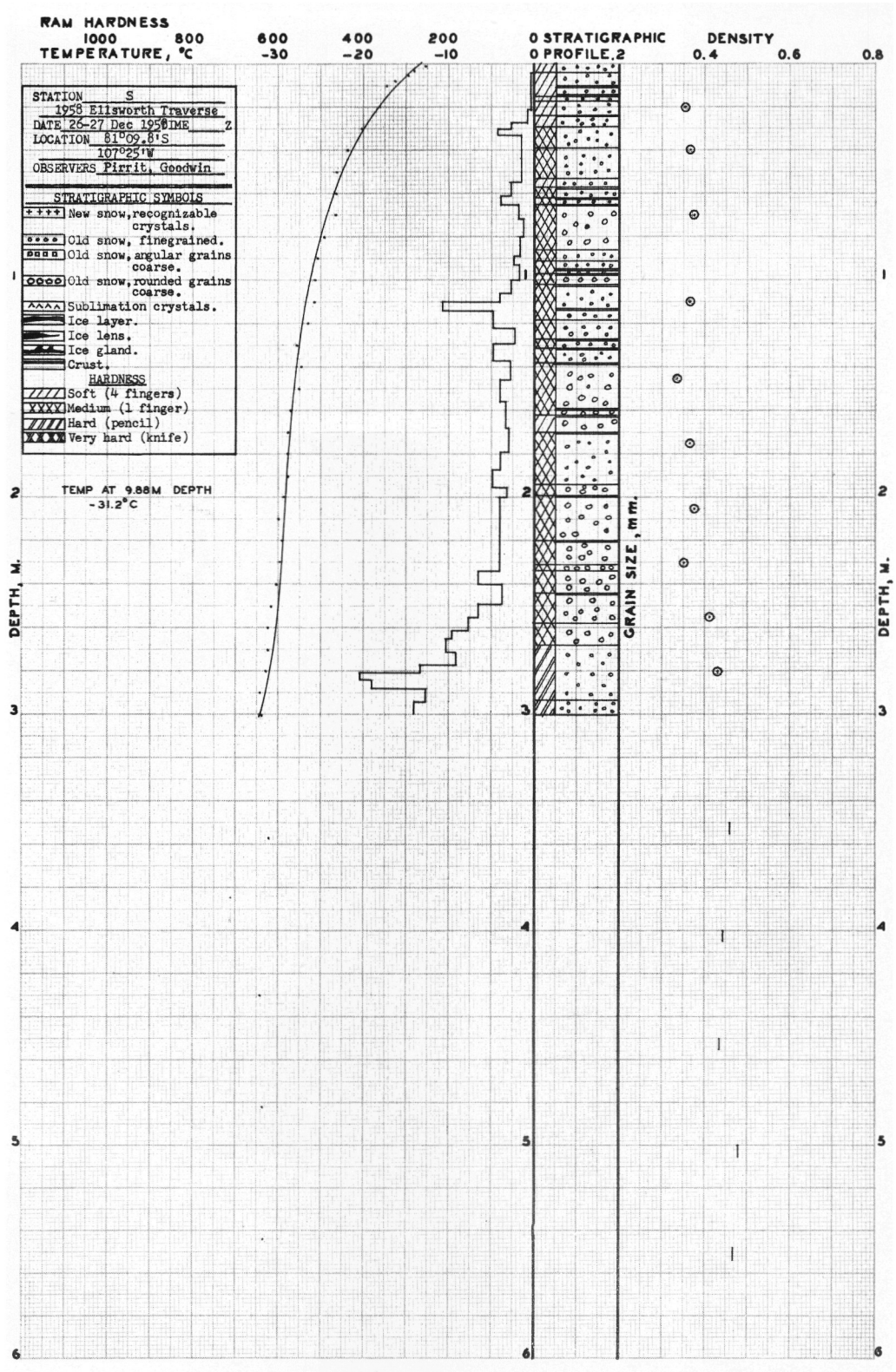

RAM HARDNESS
1000 800
TEMPERATURE, °C
600 400 200
-30 -20 -10
0 STRATIGRAPHIC
0 PROFILE.2
DENSITY
0.4 0.6 0.8
STATION R
1958 Ellsworth Traverse
DATE 24 December 58 TIME Z
LOCATION 81°19.8'S
104°32'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.96M DEPTH
-32.4° C
DEPTH, M.
GRAIN SIZE, mm.
DEPTH, M.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station R
Date 24 December 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 8	F	M	L	
8- 12	F	M	M	
12- 15	F	S	L	
15- 27	F	M	M	Crust at 19
27				Crust
27- 49	F	M	M	Crust at 35
49- 52	F	S	L	
52				Crust
52- 70	F	S	L	
70				Crust
70- 74	M	S	L	
74- 81	F	M	M	
81- 85	M	S	L	Crust at 83
85				Crust
85- 94	F-M	M	M	
94-101	F	M	M	
101-112	F	M	M	
112-115	M	S	L	
115-131	M	M	M	
131-135	F	M	F	
135				Crust
135-148	M	S	L	
148-152	M	M	M	
152-154	M	S	L	
154-167	M	M	M	
167				Crust
167-174	M	S	M	
174-180	M	S	L	
180-186	F	H	F	
186-208	M	S	M	
208-215	F	H	F	
215-218	M-C	S	L	
218-231	F	H	F	
231				Crust
231-243	M	S	M	
243-252	F	H	F	
252-257	M	S	L	
257-300+	F	H	F	


RAM HARDNESS
1000 800
TEMPERATURE, °C
600 400 200
-30 -20 -10
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION S
1958 Ellsworth Traverse
DATE 26-27 Dec 1958 GMT Z
LOCATION 81°09.8'S
107°25'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.88M DEPTH
-31.2°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station S
Date 26-27 December 1958
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

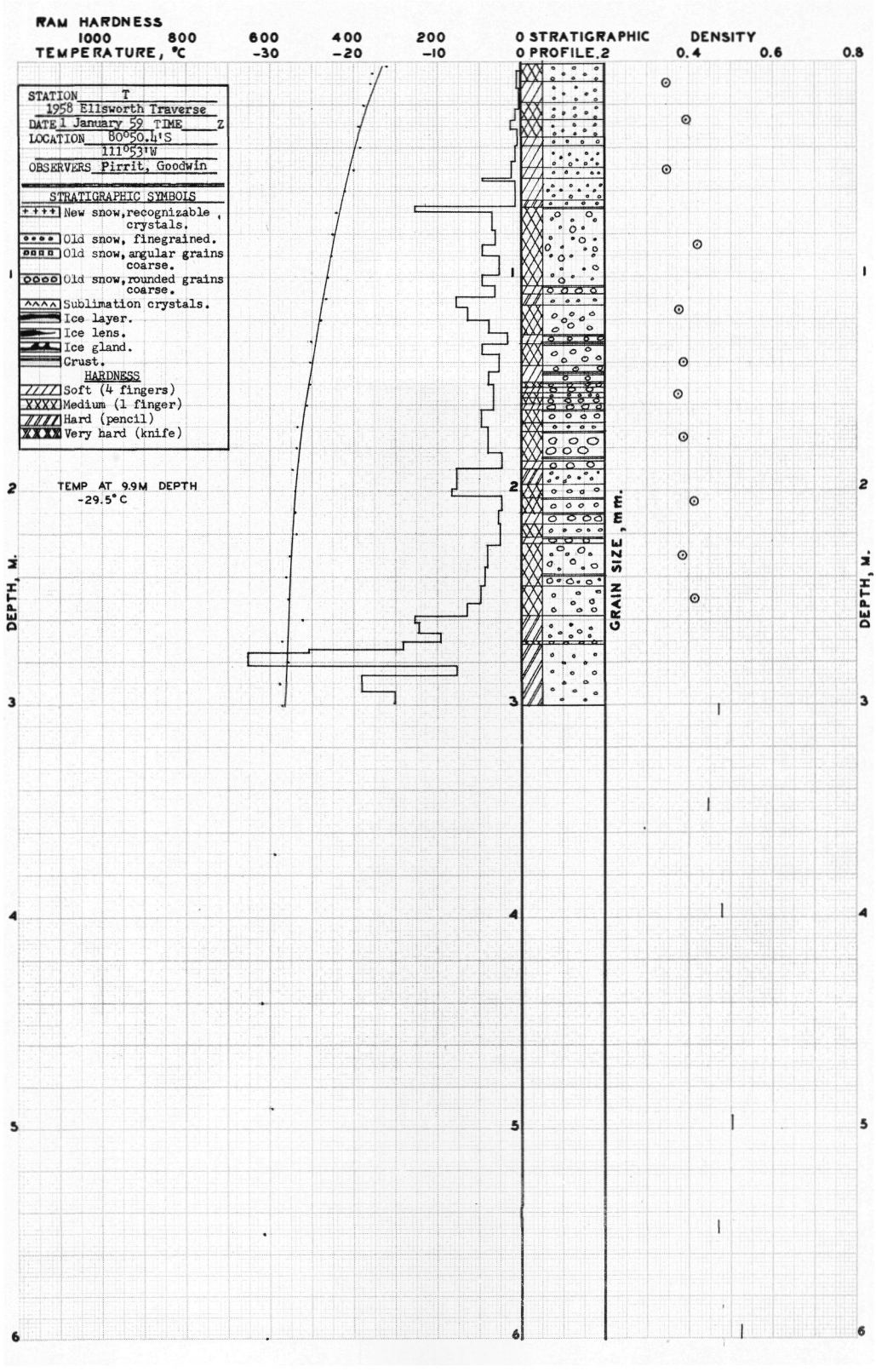
Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 4	F	S	L	
4- 15	F	S	L	Crust at 10 and 14
15- 17	F	S	L	
17- 24	F	S	L	
24				Ice band at 24
24- 29	F	S	L	
29				Crust
29- 39	F	M	M	
39				Crust
39- 53	F	M	L	
53- 57	F	S	L	
57				Crust
57- 62	F	M	M	
62				Crust
62- 65	F	M	M	Crust at 63
65- 66	F	S	L	
66- 86	M	M	M	
86- 91	F	M	L	
91- 97	F	M	M	Crust at 95
97				Crust
97-102	M	S	L	
102				Crust
102-118	F	M	F	Crust at 113
118-127	F	M	M	
127				Crust
127-131	F	M	M	
131				Crust
131-138	F	M	F	
138				Crust
138-162	M	M	M	Crust at 159
162				Crust
162-170	M	S	L	
170				Crust
170-194	F	M	M	
194-199	M	M	M	
199				Crust
199-220	M	M	F	
220				Crust
220-231	M	M	M	
231-234	M	M	L	
234-244	M	M	M	
244				Crust

Ellsworth Traverse

Station S (Continued)

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
244-258	M	M	M	
258-268	M	M	F	
268-293	F	H	F	
293-300	F	H	F	


RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION T
1958 Ellsworth Traverse
DATE 1 January 59 TIME Z
LOCATION 80°50.4'S
111°53'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.9M DEPTH
-29.5° C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
F - Firm

Ellsworth Traverse
Station T
Date 1 January 1959
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

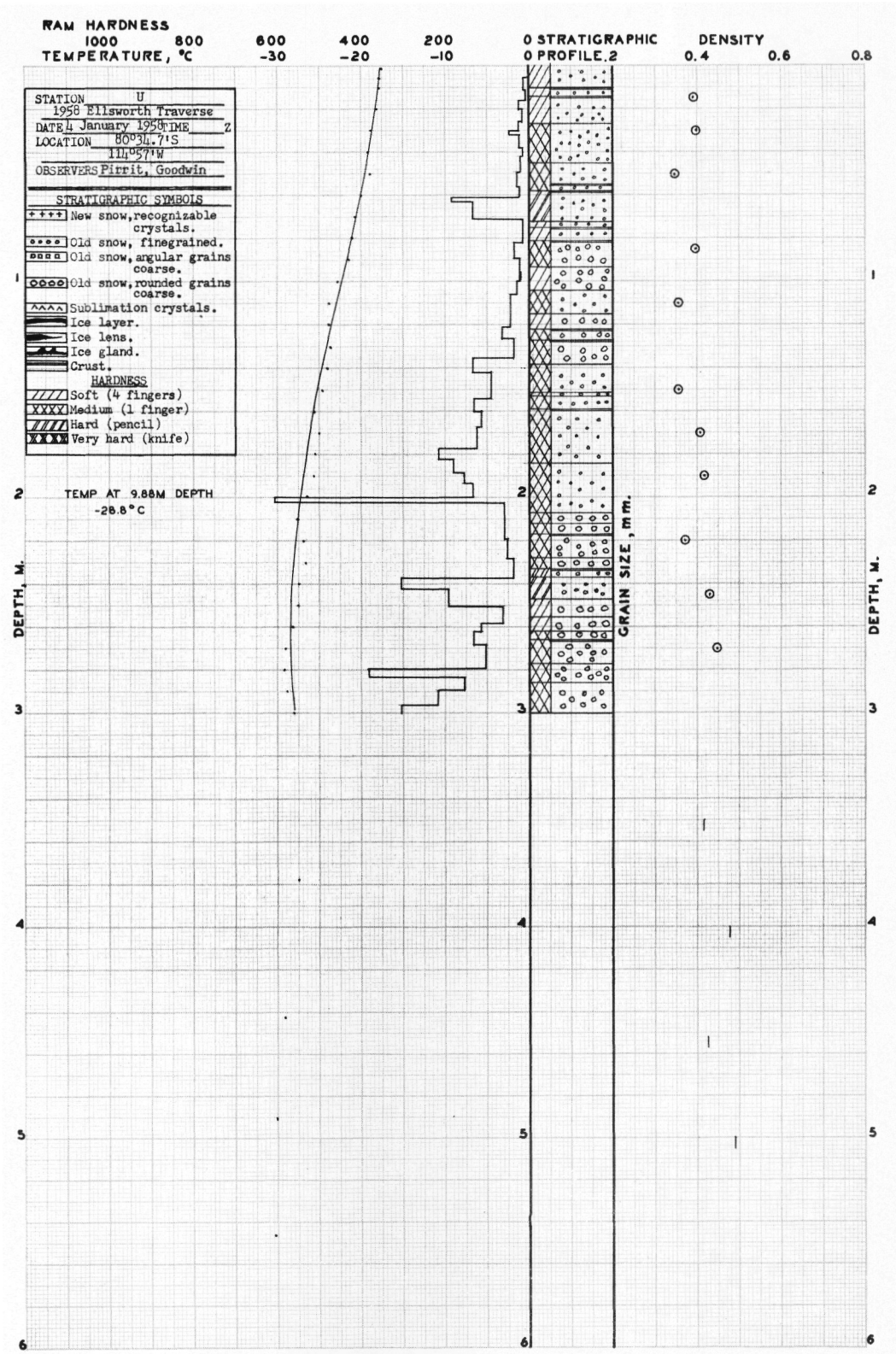
Depth cm	Grain Size	Hardness	Bonding	Remarks
1- 9	F	M	F	
9- 19	F	S	L	
19- 27	F	M	L	
27- 35	F	M	M	
35- 39	F	S	L	
39- 49	F	S	M	
49- 54	F	S	L	
54- 64	F	M	M	
64- 67	F	H	F	
67				Crust
67-104	F-M	M	M	
104				Crust
104-108	M	S	L	
108-113	F	H	F	
113-127	M	M	M	
127				Crust
127-131	M	S	L	Crust at 130
131				Crust
131-141	M	M	M	
141-149	M	S	L	Crust at 144 and 145
149				Crust
149-151	M	M	M	
151-154	M-C	S	L	
154-156	F	M	M	
156-159	M	M	M	
159-162	C	S	L	
162				2 mm crust
162-168	M	M	M	
168-172	F	M	M	
172				Crust
172-186	C	M	M	Crust at 184
186-189	C	S	L	
189-197	F	H	F	
197-203	M	M	M	
203				Crust
203-210	M	M	M	
210				Crust
210-215	C	S	M	
215-221	F	M	M	
221				Crust
221-224	C	S	L	
224-244	F-M	M	M	Crust at 239

Ellsworth Traverse

Station T (Continued)

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
244-258	M	M	M	
258-270	F	H	F	
270-271	M	M	L	
271-300	F	H	F	

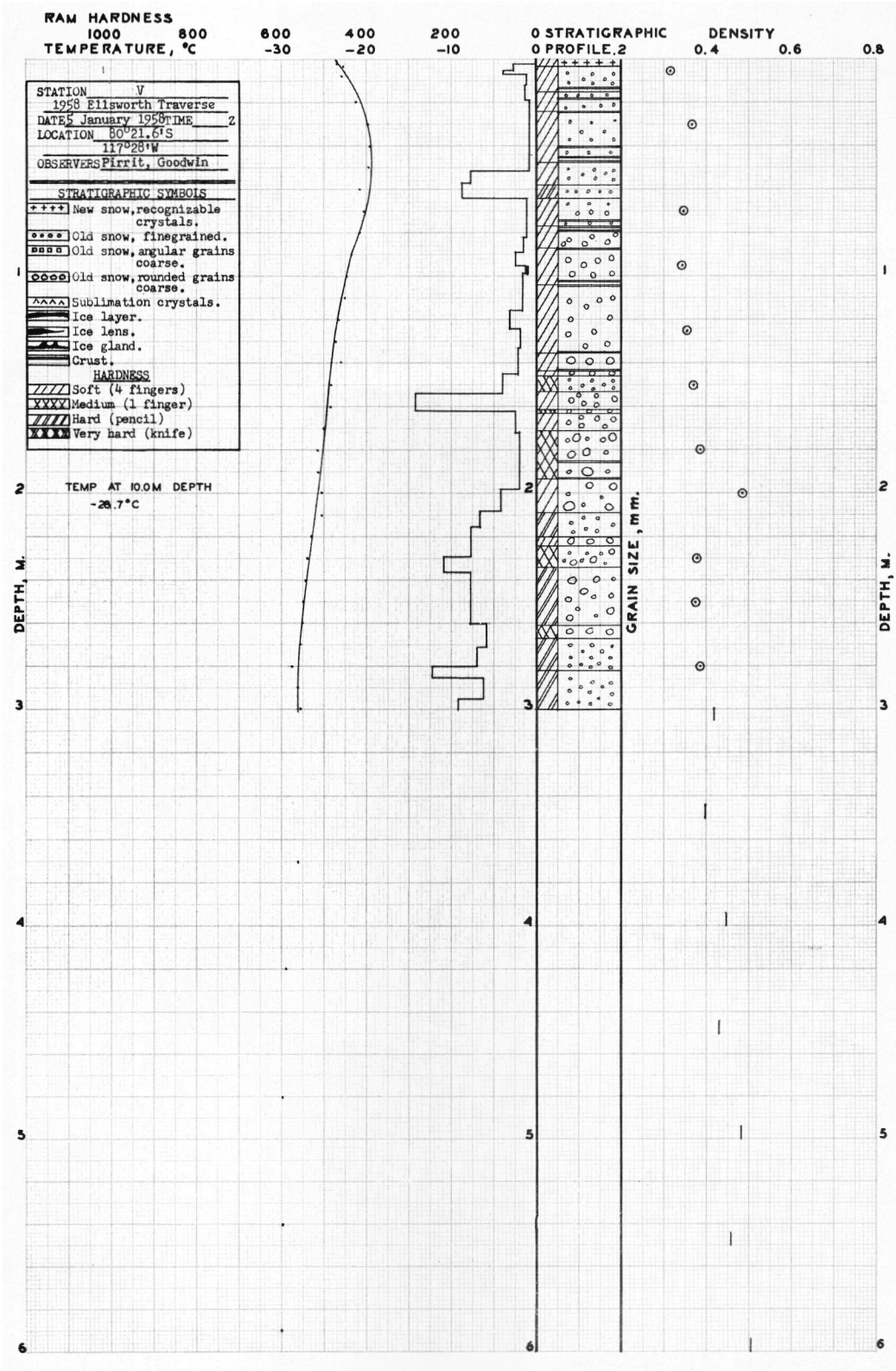

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC
0 PROFILE.2
DENSITY
0.4 0.6 0.8
STATION U
1958 Ellsworth Traverse
DATE 4 January 1958 TIME Z
LOCATION 80°34.7'S
111°57'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 9.88M DEPTH
-28.8°C
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
H - Hard

Ellsworth Traverse
Station U
Date 4 January 1959
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
0- 10	F	S	L	
10				3 mm crust
10- 14	F	S	L	
14				Crust
14- 27	F	S-M	M	
27- 45	F	M	L	
45- 58	F	M	L	Crust at 55
58				Crust
58- 72	F	H	F	
72- 75	M	S	L	
75				Thin crust
75- 81	M	S	L	
81				Thin crust
81- 93	M	M	M	
93-104	M	S	M	
104-115	F	M	M	
115-122	M	S	L	
122				Crust
122-127	M	M	M	
127				Crust
127-138	M	M	M	
138-151	F	M	F	
151-153	F	M	F	
153-159	F	M	M	
159				Crust
159-184	F	M	F	
184-207	F	M	F	
207-212	C	M	M	
212-217	M	M	M	
217-228	M	M	M	Crust at 218
228-233	M	M	M	
233				Crust
233-237	C	S	L	Constructive metamorphism
237-247	F	H	F	
247-255	M	S-M	M	
255-262	M	S-M	M	
262-266	M	M	F	
266				Crust
266-277	M	M	M	
277-286	M	M	F	
286-300+	M	M	F	


RAM HARDNESS
1000 800
TEMPERATURE, °C
600 400 200
-30 -20 -10
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION V
1958 Ellsworth Traverse
DATE 5 January 1958 TIME Z
LOCATION 80°21.6'S
117°28'W
OBSERVERS Pirrit, Goodwin
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
TEMP AT 10.0M DEPTH
-28.7°C
DEPTH, M.
GRAIN SIZE, mm.
DEPTH, M.
1
2
3
4
5
6

Bonding Symbols:
L - Loose
M - Medium
H - Hard

Ellsworth Traverse
Station V
Date 5 January 1959
Observers Goodwin, Pirrit

STRATIGRAPHIC DATA SHEET

Depth cm	Grain Size	Hardness	Bonding	Remarks
1- 3		F,S,L		New snow
3- 15	F	S	L	Crust at 13; well stratified
15- 24	F	S	L	Crust at 18; well stratified
24				Crust
24- 48	F	S	L	Crust at 40, 45, and 47; well stratified
48- 58	F	S-M	L	
58- 64	F	H	F	
64- 77	F-M	S	L	Crust at 74
77				Crust
77- 87	M	S	L	Crust at 79
87				Crust
87-104	M	S-M	L	Crust at 102
104				Crust
104-135	M	S	M	
135				Ice bed
135-143	C	S	L	
143				Crust
143-146	M	S	L	
146-153	F	M	M	
153-161	M	S	L	
161-163	M	M	M	
163-171	M	S	L	
171-193	M-C	M	M	Crust at 185
193				Crust
193-209	M-C	S-M	M	
209-220	F	H	F	
220-224	C	S	L	
224-234	F-M	M	F	
234-261	M	H	F	
261-267	M	M	M	
267-282	F	H	F	1 cm soft at 276-277
282-300	F	H	F	1 cm soft at 286-287

RAM HARDNESS DATA SHEET

Station Ellsworth Traverse
Observers Pirrit, Goodwin

Depth cm	Hardness Number, Kg
Station between Pits A and B 14 February 1958	
0- 5	2
5- 13	7
13- 18	12
18- 27	13
27- 32	32
32- 39	23
39- 47	12
47- 53	9
53- 59	10
59- 65	15
65- 70	18
70- 82	20
82- 88	12
88-100	10
100-107	17
107-115	21
115-120	33
120-126	36
126-130	23
130-139	19
139-143	18
143-149	20
149-154	7
154-160	11
160-170	15
170-175	27
175-182	16
182-193	16
193-196	57
196-200	74
200-205	84
205-215	30
215-223	29
223-230	19
230-236	44
236-242	62
242-251	16
251-258	23
258-265	27
265-275	69
275-282	92
282-290	119
290-300	33

Depth cm	Hardness Number, Kg
Station between Pits D and E 27 February 1958	
0- 5	2
5- 17	19
17- 29	31
29- 35	29
35- 44	6
44- 50	9
50- 55	10
55- 61	19
61- 65	52
65- 70	26
70- 74	17
74- 83	9
83- 87	17
87- 91	27
91- 95	37
95-100	22
100-104	38
104-108	38
108-114	23
114-120	53
120-124	41
124-128	43
128-132	13
132-141	16
141-144	16
144-150	20
150-156	10
156-160	53
160-163	103
163-166	103
166-170	66
170-175	53
175-179	41
179-184	33
184-189	43
189-193	66
193-199	86
199-202	54
202-206	79
206-208	104
208-213	44
213-216	37
216-219	37
219-221	64
221-225	54
225-229	67
229-236	61
236-241	44
241-248	75
248-253	104
253-255	129
255-257	129
257-260	66
260-264	51
264-269	78
269-276	33
276-284	17
284-286	36
286-290	36
290-295	42
295-300	30
300-307	24
307-312	31
312-315	47
315-319	52
319-324	43
324-329	25
329-334	43
334-340	52
340-348	37
348-355	41
355-362	41
362-365	47
365-374	60
374-379	79
379-386	46
386-390	52
390-394	52
394-397	47
397-400	67

RAM HARDNESS DATA SHEET

Station Ellsworth Traverse
Observers Goodwin, Pirrit

Depth cm	Hardness Number, Kg
Station Mile 253.1	
11 November 1958	
0- 4	2
4- 12	3
12- 19	16
19- 24	42
24- 29	44
29- 34	14
34- 42	40
42- 44	92
44- 48	49
48- 57	15
57- 65	12
65- 69	12
69- 74	18
74- 79	58
79- 84	82
84- 90	85
90- 96	94
96- 99	85
99-103	20
103-109	35
109-118	18
118-123	17
123-129	25
129-135	105
135-141	55
141-146	149
146-152	155
152-156	230
156-164	193
164-175	32
175-184	25
184-190	50
190-199	75
199-202	156
202-206	164
206-213	122
213-218	60
218-225	70
225-232	135
232-242	66
242-247	126
247-251	126
251-256	54
256-266	96
266-270	29
270-276	51
276-280	51
280-286	156
286-291	156
291-297	81
297-300	66
300-308	82
308-313	61
313-319	67
319-325	107
325-331	207
331-337	307
337-341	120
341-350	141
350-357	221
357-363	207
363-367	232
367-372	367
372-377	307
377-382	307
382-386	382
386-390	382
390-397	221
397-400	407
Station between Pits F and G	
22 November 1958	
0- 2	2.5
2- 5	22
5- 13	12
13- 15	52
15- 21	35
21- 27	42
27- 33	32
33- 40	6
40- 46	19
46- 50	29
50- 55	74
55- 60	52
60- 70	24
70- 77	21
77- 81	54
81- 85	129
85- 99	23
99-105	36
105-108	70
108-112	103
112-120	61
120-128	61
128-137	18
137-147	15
147-154	22
154-163	17
163-169	25
169-181	38
181-189	20
189-198	32
198-204	86
204-209	22
209-218	17
218-226	16
226-233	34
233-239	56
239-245	48
245-251	46
251-261	50
261-270	50
270-277	63
277-283	31
283-292	86
292-300	24
Station between Pits G and H	
24 November 1958	
0- 2	3
2- 12	7
12- 16	52
16- 19	135
19- 24	76
24- 37	22
37- 43	42
43- 48	56
48- 55	42
55- 63	32

RAM HARDNESS DATA SHEET

Station Ellsworth Traverse
Observers Goodwin, Pirrit

Depth cm	Hardness Number, Kg
63- 68	58
68- 77	39
77- 86	38
86- 93	10
93- 96	103
96-103	67
103-110	67
110-118	41
118-126	53
126-135	42
135-140	73
140-147	95
147-158	38
158-163	125
163-172	58
172-181	25
181-190	72
190-194	80
194-205	55
205-215	66
215-226	63
226-236	87
236-242	126
242-249	143
249-260	82
260-269	56
269-277	118
277-286	139
286-295	139
295-300	156

Station between Pits H and I
29 November 1958

0- 1	4
1- 13	19
13- 20	53
20- 25	42
25- 30	34
30- 39	22
39- 48	22
48- 53	62
53- 59	55
59- 64	82
64- 73	52

Depth cm	Hardness Number, Kg
73- 85	29
85- 90	50
90- 94	82
94- 96	153
96-103	89
103-110	48
110-119	25
119-129	47
129-138	58
138-150	73
150-158	118
158-168	101
168-177	58
177-189	73
189-195	45
195-207	56
207-211	126
211-218	96
218-225	135
225-233	111
233-242	99
242-252	66
252-263	88
263-269	206
269-275	206
275-285	141
285-295	156
295-300	216

Station between Pits I and J
30 November 1958

0- 1	3
1- 11	14
11- 19	17
19- 24	42
24- 31	19
31- 35	27
35- 37	152
37- 40	169
40- 44	229
44- 50	304
50- 54	454
54- 59	454
59- 71	79

Depth cm	Hardness Number, Kg
71- 85	55
85- 95	76
95-106	49
106-121	65
121-127	155
127-136	125
136-146	53
146-157	46
157-168	46
168-170	319
170-178	193
178-186	286
186-195	338
195-202	327
202-211	73
211-217	126
217-227	126
227-234	220
234-241	220
241-250	339
250-257	435
257-265	273
265-276	88
276-287	115
287-292	156
292-300	231

Station between Pits J and K
3 December 1958

0- 1	3
1- 11	22
11- 18	31
18- 23	62
23- 25	252
25- 31	204
31- 41	154
41- 48	197
48- 66	37
66- 72	104
72- 81	171
81- 90	171
90- 95	184
95-100	305
100-108	193

RAM HARDNESS DATA SHEET

Station Ellsworth Traverse
Observers Goodwin, Pirrit

Depth cm	Hardness Number, Kg	Depth cm	Hardness Number, Kg	Depth cm	Hardness Number, Kg
108-115	326	129-136	219	130-139	112
115-123	231	136-144	155	139-149	140
123-134	87	144-150	255	149-159	185
134-143	65	150-159	205	159-168	88
143-155	65	159-165	380	168-178	35
155-160	185	165-172	382	178-194	50
160-170	200	172-176	380	194-197	95
170-178	193	176-183	219	197-203	156
178-184	255	183-193	95	203-213	126
184-194	185	193-197	50	213-220	135
194-201	40	197-204	135	220-224	381
201-210	106	204-212	119	224-231	220
210-216	231	212-229	77	231-238	156
216-224	250	229-238	73	238-242	381
224-231	263	238-242	306	242-248	381
231-239	381	242-246	381	248-255	263
239-245	381	246-250	381	255-265	111
245-254	339	250-257	220	265-275	96
254-264	186	257-265	194	275-282	263
264-272	194	265-275	231	282-289	327
272-278	381	275-285	156	289-295	256
278-285	392	285-291	256		
285-294	173	291-295	269		
294-300	156				

Station between Pits K and L
5 December 1958

0- 1	3
1- 5	52
5- 16	47
16- 25	58
25- 29	154
29- 37	154
37- 50	96
50- 61	114
61- 70	87
70- 80	34
80- 82	364
82- 91	104
91- 97	34
97-102	125
102-110	99
110-120	109
120-129	122

Station between Pits L and M
8 December 1958

0- 1	3
1- 12	20
12- 20	40
20- 21	252
21- 23	754
23- 30	218
30- 44	36
44- 55	29
55- 60	76
60- 67	133
67- 71	454
71- 83	67
83- 91	60
91- 97	54
97-104	82
104-112	118
112-120	61
120-130	95

Station between Pits M and N
11 December 1958

0- 3	2
3- 13	32
13- 15	252
15- 20	302
20- 33	66
33- 43	14
43- 50	36
50- 58	13
58- 66	40
66- 75	55
75- 89	32
89- 95	27
95-101	55
101-110	55
110-118	73
118-125	69
125-132	48
132-139	125
139-150	60
150-159	72

RAM HARDNESS DATA SHEET

Station Ellsworth Traverse
Observers Goodwin, Pirrit

Depth cm	Hardness Number, Kg
159-169	65
169-176	31
176-178	455
178-187	138
187-194	219
194-203	173
203-212	56
212-220	40
220-223	206
223-230	220
230-238	44
238-247	46
247-256	106
256-265	56
265-271	81
271-283	131
283-295	131

Station between Pits N and O
15 December 1958

0- 4	3
4- 12	27
12- 20	47
20- 31	31
31- 42	29
42- 50	40
50- 61	27
61- 65	10
65- 71	29
71- 80	33
80- 88	52
88- 95	57
95-102	74
102-108	86
108-118	77
118-128	50
128-140	105
140-146	246
146-155	172
155-163	118
163-171	99
171-182	46
182-192	68
192-195	85
195-203	141
203-212	173
212-222	126
222-230	81
230-240	87
240-249	139
249-262	179
262-272	156
272-281	106
281-287	256
287-295	287

Station between Pits O and P
18 December 1958

0- 8	2
8- 18	10
18- 21	69
21- 24	169
24- 34	76
34- 46	154
46- 55	24
55- 66	12
66- 72	19
72- 80	30
80- 93	22
93- 96	34
96-101	65
101-110	58
110-123	40
123-133	29
133-138	53
138-145	48
145-151	50
151-161	47
161-172	49
172-176	95
176-187	70
187-195	35
195-202	92
202-210	126
210-220	66
220-230	96
230-240	156
240-247	177
247-256	139
256-268	131
268-278	126
278-288	96
288-295	135

Station between Pits P and Q
21 December 1958

0- 2	3
2- 18	11
18- 25	16
25- 29	52
29- 38	33
38- 45	13
45- 55	26
55- 59	77
59- 65	44
65- 75	18
75- 85	32
85- 94	46
94-104	53
104-114	59
114-127	60
127-138	27
138-147	25
147-160	42
160-168	80
168-187	68
187-194	39
194-200	56
200-210	60
210-224	135
224-238	113
238-247	89
247-256	173
256-264	231
264-279	106
279-283	306
283-290	327
290-295	306

RAM HARDNESS DATA SHEET

Station Ellsworth Traverse
Observers Goodwin, Pirrit

Depth cm	Hardness Number, Kg
Station between Pits Q and R 23 December 1958	
0- 2	3
2- 10	17
10- 20	14
20- 30	22
30- 37	8
37- 41	32
41- 51	27
51- 59	46
59- 68	46
68- 80	49
80- 88	38
88- 96	34
96-116	35
116-118	305
118-132	65
132-146	39
146-160	69
160-172	65
172-181	85
181-188	219
188-194	305
194-205	129
205-220	66
220-231	137
231-235	381
235-242	220
242-250	287
250-255	456
255-260	456
260-269	189
269-279	276
279-287	394
287-293	381
293-295	456
Station between Pits R and S 24 December 1958	
0- 1	3
1- 12	9
12- 20	22
20- 28	32
28- 40	29
40- 52	35
52- 58	85
58- 67	164
67- 78	59
78- 90	34
90- 94	94
94-105	92
105-119	63
119-132	60
132-146	56
146-156	50
156-163	56
163-172	72
172-182	77
182-186	305
186-199	86
199-213	57
213-222	46
222-228	66
228-233	186
233-245	131
245-252	177
252-260	231
260-266	381
266-271	366
271-278	327
278-285	327
Station between Pits S and T 29 December 1958	
0- 1	2
1- 11	82
11- 18	73
18- 30	62
30- 40	56
40- 49	22
49- 58	29
58- 69	51
69- 77	47
77- 87	38
87- 96	32
96-106	41
106-117	70
117-133	61
133-144	114
144-153	72
153-166	97
166-176	125
176-190	59
190-195	125
195-215	66
215-217	231
217-230	54
230-238	96
238-246	137
246-253	70
253-260	75
260-267	177
267-272	306
272-276	456
276-283	349
283-288	306
288-294	381
Station between Pits T and U 3 January 1959	
0- 1	3
1- 11	17
11- 20	22
20- 30	8
30- 39	9
39- 46	16
46- 49	55
49- 51	202
51- 53	364
53- 63	109
63- 71	60
71- 79	72
79- 85	304
85- 92	218
92- 97	154
97-111	134
111-119	43
119-128	95
128-133	77
133-144	114

RAM HARDNESS DATA SHEET

Station Ellsworth Traverse
Observers Goodwin, Pirrit

Depth cm	Hardness Number, Kg	Depth cm	Hardness Number, Kg	Depth cm	Hardness Number, Kg
144-155	114	215-222	57		
155-165	125	222-230	40		
165-177	50	230-235	42		
177-188	21	235-244	59		
188-197	38	244-249	126		
197-202	54	249-254	246		
202-207	54	254-262	231		
207-216	66	262-272	186		
216-223	135	272-276	456		
223-232	113	276-280	569		
232-242	126	280-284	569		
242-251	173				
251-260	256				
260-264	569				
264-268	569				

Station between
Pits U and V
4 January 1959

0- 1	2
1- 11	9
11- 19	29
19- 27	17
27- 36	35
36- 45	24
45- 48	82
48- 50	252
50- 59	82
59- 68	135
68- 83	42
83- 96	48
96-102	20
102-114	55
114-123	45
123-132	25
132-137	65
137-144	74
144-150	105
150-162	58
162-169	44
169-177	73
177-189	73
189-196	56
196-206	51
206-215	56

WEATHER RECORD OF ELLSWORTH TRAVERSE

Abbreviations

Ci	cirrus	Cb	cumulonimbus	CLR	clear
Cc	cirrocumulus	F	fog	OVC	overcast layer
Cs	cirrostratus	IF	ice fog	X	obscuration
Ac	altocumulus	H	haze	-X	partial obscuration
As	altostratus	GF	ground fog	BS	blowing snow
Ns	nimbostratus	w	whiteout	E	east
Sc	stratocumulus	O	clear sky	N	north
St	stratus	BRKN	broken layer	S	south
Cu	cumulus	SCTD	scattered layer	W	west

Date	Type	Time	Sky and Ceiling Hundreds of Feet	Visibility Miles	Weather and Obstructions to Vision	Sea Level Press.	Temp. °F.	Wind Dir.	Wind Speed	Altimeter	Remarks and Supplemental Data
1958											
2/6	R	1700	O	30	H	983	9	S	2		
2/7	R	1700	2/10,1	30		984	0	SSE	1		St, broken layer aloft
2/8	R	1700	O	30		988	- 6	S	2		CLR
2/9	R	1700	1/10,3	30	IF	984	- 5	E	1		St, broken
2/10	S	0700	10/10	1/2	F						Fog lifted by 1000 hours
2/10	R	2400	1/10,-X	1	IF	980	-14	E	1		IF morning and evening; partial obscuration
2/11	R	1700	X	1/2	IF	978	-10	NNW	1		Obscuration
2/12	R	1800	-X	1/2	IF	979	-16	SE	1		GF 50 - 75' thick
2/13	R	2000	O	30		982	-20	O	2		CLR
2/15	R	2000	1/10	30		991	-13	E	1		Thin SCTD St 35
2/16	R	1700	4/10	30		996	- 3	SE	4		E 120 As SCTD
2/20	R	1800	O,-X	30	H	960	- 3	SE	4		CLR to partial obscuration
2/21	R	1800	7/10	20		976	- 4	NW	4		E 35 Ac BRKN
2/22	R	1800	1/10	30		984	-10	NW	10		E 10 St SCTD
2/22	S	2200	10/10	1/4	F		- 4		10		

WEATHER RECORD OF ELLSWORTH TRAVERSE
(Continued)

Date	Type	Time	Sky and Ceiling Hundreds of Feet	Visibility Miles	Weather and Obstructions to Vision	Sea Level Press.	Temp. °F.	Wind Dir.	Wind Speed	Altimeter	Remarks and Supplemental Data
1958											
10/29	R	1800	X		F+						
10/31	R	1800			BS	79.8		WSW	7	275	
11/1	R	1800				79.4		WSW	15	262	
11/3	R	1800	0		BS+					351	
11/4	R	1800	BRKN,50	10	0	72.6	6	S	6	342	Sc
11/6	R	1800	BRKN,6	10	0	85.4	10	NNW	8	232	BINOVC to W, St
11/7	R	1800	SCTD,200	15+	0	90.7	- 2	SSW	4	184	Cs
11/8	R	1800	0	15+	0	89.7	- 2	ESE	2	194	CLR
11/9	R	1800	SCTD,200	15+	0	88.4	- 9	SSE	5	235	Ci
11/10	R	1800	OVC,30	10	0	80.1	4	0	0	273	St, OVC, INTMT SNW B 2000
11/11	R	1800	OVC	3	S-	77.3	- 1	SE	5	296	OVC, INTMT SNW, dry, E 2400
11/12	R	1800	BRKN,60	12	0	77.2	- 4	S	2	297	60 Ac/Ci 20
11/13	R	1800	OVC	1/2	w	78.3	- 2	0	0	288	OVC VLT SNW INT w
11/14	R	1800	OVC	1/2	w	79.8	13	0	0	277	OVC BINOVC to N
11/15	R	1800	0	15+	0	96.7	- 3	SSE	7	1008	CLR
11/16	R	1800	THIN SCTD	15	0	64.9	2	0	0	400	Thin scattered layer Cs
11/17	S	0900	SCTD,V205	15+	0	71.4	- 2	0	0	345	Thin scattered layer Ci and Cs
11/17	R	1800	BRKN,150V	8	H	68.0	- 4	ESE	10	375	Ci and Cs
11/18	R	1800	0	15+	0	68.8	5	0	0	368	CLR
11/19	S	0900	0	15+	0	71.6		0	0	344	
11/19	R	1800	SCTD,V250	15	0	76.0		0	0	307	V St 250
11/20	R	1800	SCTD,20	10	0	83.8	7	SSE	5	240	St and Cs
11/21	S	0900	0	15	0	77.6		SSE	10	294	CLR
11/21	R	1800	0	15+	0	69.0	4	SSE	5	377	CLR
11/22	S	0900	SCTD,150	15	0	58.3	3	SSE	7	458	Ci
11/22	R	1600	0	15+	0	56.2	7	SSE	7	478	CLR
11/23	R	1600	SCTD,150	15	0	60.1	10	0	0	446	Layer St to N
11/24	S	1000	SCTD,200	15+	0	60.7	16	0	0	437	CLR

WEATHER RECORD OF ELLSWORTH TRAVERSE
(Continued)

Date	Type	Time	Sky and Ceiling Hundreds of Feet	Visibility Miles	Weather and Obstructions to Vision	Sea Level Press.	Temp. °F.	Wind Dir.	Wind Speed	Altimeter	Remarks and Supplemental Data
1958											
11/25	S	1000	SCTD,150	15	0	53.8	10	0	0	498	CLR, layer Cs NE
11/25	R	1600	SCTD,200	15	0	49.5	10	0	0	533	Ci to W
11/28	R	1600	SCTD,200	15+	0	51.7	7	SW	2	513	Cs to N
11/29	R	1600	X,5	5	w	45.9	6	W	5	570	Whiteout
11/30	S	1000	OVC	5	w	42.1	4	NNW	8	598	BINOVC, whiteout
11/30	R	1600	CLR	15		38.7	3	0		830	CLR
12/1	S	1000	0	15+	0	20.3		S	17	795	CLR, BS
12/1	R	1600	0	15+	0	12.3	3	S	9	862	CLR
12/2	S	1000		10	0	18.2	- 6	SE	8	816	Cloud bank to E, est. 2 thick
12/2	R	1600	SCTD,1	15+	0	19.8	- 2	SE	7	798	Low layer St to NE
12/3	S	1000	0	15+	0	13.0		S	12	859	CLR
12/3	R	1600	0	15+	0	94.2	3	SE	8	1032	Small layer Cs to W
12/4	S	1000	SCTD,200	15+	0	88.2	- 2	SW	11	1188	Ci and Cs
12/4	R	1600	SCTD,200	15+		85.2	1	SW	6	1214	Ci
12/5	S	1000	0	15+	0	71.5		SW	20	1314	CLR
12/5	R	1600	SCTD,120	15	BS	76.8	- 5	SW	21	1468	Cs E and S/BS
12/6	S	1000	THIN OVC 30	10		76.5		SW	16	1533	St W/BINOVC to E
12/6	R	1600	OVC,30	10	Lt snw	65.9		SW	12	1578	Light snow
12/7	S	1000	THIN OVC 4	10		67.3		S	9	1596	OVC BINOVC
12/7	R	1500	BRKN,4	10		66.8	- 5	SW	12	1591	OVC BINOVC
12/8	S	0900	OVC,20	10		67.8		SW	18	1627	OVC, partial whiteout
12/8	R	1500	THIN OVC 40	10		67.2		SW	16	1712	BINOVC
12/9	S	0900	OVC,30	7	w	67.0		SW	24	1824	OVC
12/9	R	1500	THIN OVC 30	10		67.6	- 6	SW	18	1810	BINOVC
12/10	S	0900	SCTD,200	15			4			1756	Ci (Bar off scale)
12/10	S	1900	0	15				SW	10	1757	CLR

WEATHER RECORD OF ELLSWORTH TRAVERSE
(Continued)

Date	Type	Time	Sky and Ceiling Hundreds of Feet	Visibility Miles	Weather and Obstructions to Vision	Sea Level Press.	Temp. °F.	Wind Dir.	Wind Speed	Altimeter	Remarks and Supplemental Data
1958											
12/11	S	0900	OVC	5	w				0	1872	Whiteout W/OVC
12/11	S	1800	THIN OVC	8	w				0	1892	BINOVC
12/12	S	0900	OVC	2	w			W	9	2173	OVC, whiteout
12/12	R	1500	OVC	1/8	w,BS		19	WSW	22	2200	Snow and BS
12/13	S	0900	-X	1/8	GF	0.7	6	NE	15	2290	Ground fog, light snow
12/13	R	1500	OVC,20	5	Partial w	16.4	16	SW	10	2288	OVC, whiteout, 1145 SW
12/14	S	0900	OVC	1/8	Snw,w	99.8	13	N	10	2313	Light snow
12/14	R	1500	OVC,2	3/4	w	93.3	14	WNW	15	2333	Whiteout
12/15	S	0900	OVC	1/8	w,snw	95.0		E	8	2378	Whiteout, snow
12/15	R	1500	OVC	1/16	w,snw	94.2	- 5	SE	11	2390	Whiteout, snow
12/16	S	0900	OVC	1/16	w,snw					2422	
12/16	R	1500	OVC	1/16	w,snw	95.0				2422	
12/17	S	0900	THIN OVC 6	1/2	snw	88.5	-10	NE	7	2517	BINOVC, increasing cloudiness
12/17	R	1500	OVC,1	1/8	snw,w	90.5	-10	ENE	9	2478	OVC, whiteout
12/18	R	1500	-X	1/2	snw,GF	80.5		E	8	2467	Thin GF, sun visible
12/19	S	0800	OVC	1/2	F	77.2	-13	SE	7	2607	Rime, IF
12/19	R	1400	SCTD,5		IF,GF		- 8	SE	7	2600	GF and St to W
12/21	S	0800	SCTD,150	2	GF			0	0	2634	Ci, GF to W
12/21	R	1400	0	15		63.2	- 6	0	0	2648	
12/22	S	0800	-X	3/4	GF	75.2	-14	SE	2	2690	GF
12/22	R	1400	0	1	GF		-20	E	2	2696	In CLR, GF all around
12/23	S	0800	OVC,6	3/4	w			N	12	2629	Whiteout
12/23	R	1400	OVC,200	10		77.2	-10	ENE	14	2552	CLR, GF to N and W, Ci
12/24	R	1400	0	15		5.7	- 5	N	11	2466	Cloud bank to W
12/25	R	1400	X	1/16	BS						BS
12/26	S	0800	BRKN,20	5	BS		- 3	SSE	16	2477	BS, Cs and St
12/26	R	1400	X	1/8	snw,BS		4	NE	20	2410	Snow, BS

WEATHER RECORD OF ELLSWORTH TRAVERSE
(Continued)

Date	Type	Time	Sky and Ceiling Hundreds of Feet	Visibility Miles	Weather and Obstructions to Vision	Sea Level Press.	Temp. °F.	Wind Dir.	Wind Speed	Altimeter	Remarks and Supplemental Data
1958											
12/27	S	0800	SCTD,150	1/2	BS		- 3	NNE	23	2382	BS, Ci
12/27	R	1400	SCTD,150	3/4	BS	11.8	- 1	NNE	20	2373	BS, Ci
12/28	S	0800	SCTD,150 BRKN,2	15			- 4	N	12	2373	St, Ci, Cs
12/28	R	1400	OVC,2	10				N	6	2378	OVC, light intermittent snow
12/29	R	1400	X	1/16	BS	15.2	- 6	NW	12	2330	Snow, BS
12/30	S	0800	OVC,2	3/4	w		- 1	NW	10	2298	BINOVC
12/30	R	1400	THIN OVC	3	BS,GF		2	SE	15	2256	BINOVC, GF in patches, St
12/31	S	0800	THIN OVC	8			- 6	SSW	10	2247	BINOVC, St at ground level
12/31	R	1400	OVC,2	2	w	28.7	- 2	SSW	7	2182	OVC, St
1959											
1/1	S	0800	OVC	1/2	w		- 3	NW	14	2122	
1/1	R	1400	X	1/16	BS		- 3	NNW	20	2131	BS
1/2	S	0800	-X	1/16	GF,w		2	NNW	10	2127	GF, whiteout
1/3	S	0700	X	1/16	w		0	0	0	2014	Whiteout
1/3	R	1300	SCTD,1 BRKN,100	8	0		5	N	7	2015	St, As
1/4	S	0700	X	1/16	snw,w,GF		-10	SE	7	1928	Fog, whiteout, snow
1/4	R	1300	OVC,1	1	snw		-12	SSW	12	1923	Partial whiteout, snow
1/5	R	1400	0	0			- 2	E	7	1907	CLR